



R  
746  
I27  
A25

**Cornell University Library**

THE GIFT OF

*Illinois State Board of  
Health*

A. 37910

23/11/91

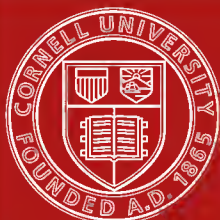
Cornell University Library  
**R 746.I27A25**

**Medical education, medical colleges and**



**3 1924 012 274 290**

ohn



Cornell University  
Library

The original of this book is in  
the Cornell University Library.

There are no known copyright restrictions in  
the United States on the use of the text.



ILLINOIS STATE BOARD OF HEALTH.

MEDICAL EDUCATION,  
MEDICAL COLLEGES

AND THE

REGULATION  PRACTICE OF MEDICINE

IN THE

UNITED STATES AND CANADA.

1765--1891.

MEDICAL EDUCATION AND THE REGULATION OF THE PRACTICE OF  
MEDICINE IN FOREIGN COUNTRIES.

---

BY JOHN H. RAUCH, M. D., SECRETARY.

---

SPRINGFIELD, ILL.:  
H. W. ROKKER, STATE PRINTER AND BINDER.  
1891.



**ILLINOIS STATE BOARD OF HEALTH.**

---

MEDICAL EDUCATION,  
  
MEDICAL COLLEGES

AND THE

REGULATION & PRACTICE OF MEDICINE

IN THE

UNITED STATES AND CANADA.

1765--1891.

MEDICAL EDUCATION AND THE REGULATION OF THE PRACTICE OF  
MEDICINE IN FOREIGN COUNTRIES.

---

BY JOHN H. RAUCH, M. D., SECRETARY.

---

SPRINGFIELD, ILL.:  
H. W. ROKKER, STATE PRINTER AND BINDER.  
1891.



A. 37910

9810 Dec

ILLINOIS STATE BOARD OF HEALTH.

---

W. A. HASKELL, M. D., <i>President</i> .....	Alton.
D. H. WILLIAMS, M. D. ....	Chicago.
NEWTON BATEMAN, LL. D. ....	Galesburg.
R. LUDLAM, M. D. ....	Chicago.
A. L. CLARK, M. D., <i>Treasurer</i> .....	Elgin.
W. R. MACKENZIE, M. D. ....	Chester.
B. M. GRIFFITH, M. D. ....	Springfield.
JOHN H. RAUCH, M. D., <i>Secretary</i> .....	Springfield.
WM. G. EGGLESTON, M. D., <i>Assistant Secretary</i> .....	Springfield.

## MEDICAL EDUCATION, MEDICAL COLLEGES AND THE REGULATION OF THE PRACTICE OF MEDICINE.

THIS REPORT had its origin in 1880, in the "Report of the Committee on Medical Education of the Illinois State Board of Health," which consisted of five pages (in the "Third Annual Report of the State Board of Health") with a small table of colleges. In this committee's report the schedule of minimum requirements, which went into effect in 1883-84, was made out and adopted by the Illinois State Board of Health. Some of the suggestions then offered hold to-day as well as they did ten years ago, although, as will be seen by a careful examination of this REPORT, great changes for the better have taken place.

It is too shamefully true that at present many students are admitted to the lecture courses, whose illiteracy prohibits their profiting by the instruction given, except in the narrowest limits, and precludes the possibility of their attaining such knowledge as the duties of the profession positively demand.

Natural talent and aptitude may go far toward fitting a man for any calling, but no talent can take the place of thorough education in a profession where such large fields of knowledge are to be mastered, and so many and such important judgments are to be constantly and promptly formed.

It is a palpable absurdity to expect to make skillful physicians of illiterate students by mere dint of reading them lectures, even when accompanied by quizzes and examinations. It is doubtful whether any examination of qualification such as can be made at the crowded opening of a session can be relied upon to assume the requisite preparation for admission.

Not less than three full years should be devoted to a diligent study of medicine, before graduating or commencement of practice. Whoever will consider the extent of the several branches of science to be mastered by the student of medicine, will easily conclude that three full years will afford but scanty time for the work. It is doubtful whether any true scholar would attempt to do this work in such time without great hesitation.

In 1881 the report on medical colleges and on medical education occupied fifty-seven pages in the "Fourth Annual Report of the State Board of Health of Illinois." This was the first time that the medical colleges of the United States and Canada were classified. After ten years it is felt that the enormous labor involved in preparing the different editions of the Report on Medical Education has been amply repaid and justified, and it is hoped that the present Report, by giving information in regard to all the medical teaching bodies in the world, will do much to increase the



knowledge in regard to medical education, and by giving the requirements in all countries will do much to bring about a higher standard in this country.

Until the second Report of this BOARD (in 1881) all that was generally known of the medical colleges in this country was printed in tabulated form in the reports of Hon. John Eaton, then U. S. Commissioner of Education.

A comparison of this, the SEVENTH REPORT ON MEDICAL EDUCATION, with the one for 1890 shows that some marked changes have taken place in the past year, and when a review is made of the changes for the better since the session of 1882-83, there is much cause for congratulation and encouragement. There are now 148 medical colleges of all kind in existence in the United States and Canada, there being 135 in this country and 13 in Canada. In 1882 the number of colleges requiring certain educational qualifications for matriculation was 45; in 1886, 114; in 1889, 117; in 1890, 124; and in this REPORT 129\*.

In 1882 the number of colleges that required attendance on three or more courses of lectures before graduation was 22; 1886, 41; in 1889, 47; in 1890, 64; in this REPORT, 85. Of the 148 colleges all have chairs of hygiene except 14†, making 123 that teach this branch, while 119 now have chairs of medical jurisprudence. In 1882 hygiene was taught in 52, and medical jurisprudence in 61 colleges; in 1886 each branch was taught in 110 colleges; in 1889, 117 taught hygiene, and 112 medical jurisprudence; and in 1890, hygiene was taught in 119, and medical jurisprudence in 114 colleges‡.

There has been also a gradual increase in the duration of the lecture terms from an average of 23.5 weeks in 1882-83, to 26.3 weeks in 1890-91. In 1882-83 there were eight colleges that had but 16 weeks. The number of colleges having terms of six months or more is now 111. In 1882-83 the number was 42; it was 49 in 1884, 50 in 1885, 52 in 1886, 55 in 1887, 63 in 1888, 66 in 1889, and 76 in 1890.

There are now in the United States 32 examining and licensing bodies that do not give instruction, and 2 in Canada. The following table shows the work of the examining and licensing bodies that examine all applicants for license to practice:

---

\*There are now in Illinois two graduates studying the three R's on probation for a license to practice.

† Not including the fraudulent colleges.

‡During the past year two colleges have died of inanition.

## RESULTS OF THE EXAMINATIONS BEFORE THE STATE BOARDS OF MEDICAL EXAMINERS

*Of Alabama,\* Minnesota, New Jersey, North Carolina, South Carolina and Virginia, from the dates of their organization to the present time.*

INSTITUTIONS REPRESENTED BY APPLICANTS.	ALABAMA.		MINNESOTA.		NEW JERSEY.		NORTH CAROLINA.		SOUTH CAROLINA.		VIRGINIA.	
	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...
Medical College of Alabama, Mobile	23	1	1	1	1	1	1	1	1	1	1	1
National Medical College, Washington	2	1	1	1	1	1	1	1	1	1	1	1
University of Georgetown, Medical Department, Washington	19	16	3	1	1	1	1	1	1	1	1	1
Howard University, Medical Department, Washington	20	9	11	5	2	2	2	2	2	2	2	2
Medical College of Georgia, Augusta	15	10	5	0	5	0	5	0	5	0	5	0
Atlanta Medical College, Atlanta	2	1	1	1	1	1	1	1	1	1	1	1
Georgia College of Eclectic Medicine and Surgery, Atlanta	14	11	3	8	0	0	1	1	1	1	1	1
Southern Medical College, Atlanta	17	9	8	1	14	7	1	1	1	1	1	1
Rush Medical College, Chicago	9	8	1	9	1	1	1	1	1	1	1	1
Chicago Medical College, Chicago	3	1	2	3	1	1	1	1	1	1	1	1
Hahnemann Medical College and Hospital, Chicago	3	1	2	3	1	1	1	1	1	1	1	1
Bennett College of Eclectic Medicine and Surgery, Chicago	6	1	5	6	1	1	1	1	1	1	1	1
Chicago Homeopathic Medical College, Chicago	5	3	2	2	1	1	1	1	1	1	1	1
College of Physicians and Surgeons, of Chicago	4	3	1	4	1	1	1	1	1	1	1	1
Medical College of Indiana, Indianapolis	5	1	4	1	1	1	1	1	1	1	1	1
College of Physicians and Surgeons, Keokuk	1	1	1	1	1	1	1	1	1	1	1	1
Medical Department, State University of Iowa, Iowa City	3	1	2	3	1	1	1	1	1	1	1	1
University of Louisville, Medical Department, Louisville	9	5	4	4	4	4	4	4	4	4	4	4
Kentucky School of Medicine, Louisville	17	10	7	1	0	0	1	1	1	1	1	1
Louisville Medical College, Louisville	47	24	23	7	0	0	22	8	13	11	5	4
Hospital College of Medicine, Louisville	8	4	4	1	1	1	4	4	4	4	4	4
Medical Department, Tulane University of Louisiana, New Orleans	9	9	0	3	0	0	3	0	3	0	3	0
Medical School of Maine, at Bowdoin College, Brunswick	5	3	2	5	2	2	2	2	2	2	2	2
University of Maryland, School of Medicine, Baltimore	162	130	32	3	0	0	82	11	24	4	53	17
College of Physicians and Surgeons, Baltimore	138	104	34	1	0	0	85	21	4	1	47	12
Baltimore Medical College, Baltimore	13	5	8	1	1	1	7	4	3	1	8	3
Baltimore University School of Medicine, Baltimore	7	1	6	1	1	1	2	1	2	2	1	1
Washington University School of Medicine, Baltimore	1	1	1	1	1	1	1	1	1	1	1	1
Harvard University School of Medicine, Boston	1	1	1	1	1	1	1	1	1	1	1	1
Boston University School of Medicine, Boston	1	1	1	1	1	1	1	1	1	1	1	1
Department of Medicine and Surgery of the University of Michigan, Ann Arbor	32	30	2	1	0	0	1	0	1	0	2	0

## Results of Examinations—Continued.

INSTITUTIONS REPRESENTED BY APPLICANTS.	Number of Applicants	Number Licensed.	Number Rejected.	ALABAMA.		MINNESOTA.		NEW JERSEY.		NORTH CAROLINA.		SOUTH CAROLINA.		VIRGINIA.	
				Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...	Applicati'ns	Rejected...
Detroit College of Medicine, Detroit.	4	4	1	...	...	2	0	...	...	...	...	...	...	2	0
Minneapolis College of Physicians and Surgeons, Minneapolis.	2	2	1	...	...	2	1	...	...	...	...	...	...	...	...
College of Medicine and Surgery, Minneapolis.	21	16	5	...	...	24	8	...	...	...	...	...	...	...	...
College of Homeopathic Medicine and Surgery, Minneapolis.	6	3	3	...	...	6	4	...	...	...	...	...	...	...	...
Minnesota Hospital College, Minneapolis.	1	1	0	...	...	1	0	...	...	...	...	...	...	...	...
St. Paul Medical College, St. Paul.	2	1	1	...	...	3	2	...	...	...	...	...	...	...	...
Missouri Medical College, St. Louis.	2	2	0	...	...	3	2	...	...	...	...	...	...	1	0
St. Louis Medical College, St. Louis.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
University Medical College of Kansas City.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Beaumont Hospital Medical College, St. Louis.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Dartmouth Hospital College, Hanover.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
College of Physicians and Surgeons in the City of New York.	17	17	0	...	...	1	0	...	...	...	...	...	...	6	0
Albany Medical College, Albany.	2	2	0	...	...	4	0	...	...	...	...	...	...	...	...
University of the City of New York, Medical Department.	56	51	5	...	...	1	0	...	...	...	...	...	...	14	4
Medical Department of the University of Buffalo.	1	1	0	...	...	1	0	...	...	...	...	...	...	...	...
Long Island College Hospital, Brooklyn.	5	5	0	...	...	1	0	...	...	...	...	...	...	...	...
New York Homeopathic Medical College, New York City.	3	3	0	...	...	2	1	...	...	...	...	...	...	...	...
Bellevue Hospital Medical College, New York City.	35	31	4	...	...	3	1	...	...	...	...	...	...	8	0
New York Medical College and Hospital for Women, New York City.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Woman's Medical College of the New York Infirmary, New York City.	2	2	0	...	...	...	...	...	...	...	...	...	...	...	...
College of Medicine of Syracuse University, Syracuse.	2	2	0	...	...	2	0	...	...	...	...	...	...	...	...
Geneva Medical College, Geneva.	1	1	0	...	...	2	1	...	...	...	...	...	...	...	...
Leonard Medical School, Raleigh.	21	17	4	...	...	...	...	...	...	...	...	...	...	1	0
Medical College of Ohio, Cincinnati.	2	2	0	...	...	1	0	...	...	...	...	...	...	5	2
Western Reserve University, Medical Department, Cleveland.	2	2	0	...	...	1	0	...	...	...	...	...	...	...	...
Eclectic Medical Institute, Cincinnati.	1	1	0	...	...	1	0	...	...	...	...	...	...	...	...
Homeopathic Hospital College, Cleveland.	3	3	0	...	...	4	3	...	...	...	...	...	...	...	...
Cincinnati College of Medicine and Surgery, Cincinnati.	2	2	0	...	...	...	...	...	...	...	...	...	...	2	0
Miami Medical College, Cincinnati.	1	1	0	...	...	...	...	...	...	...	...	...	...	1	1
Medical Department of the University of Wooster, Cleveland.	1	1	0	...	...	2	1	...	...	...	...	...	...	...	...
Pulte Medical College, Cincinnati.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Columbus Medical College, Columbus.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Western College of Homeopathic Medicine, Cleveland.	1	1	0	...	...	...	...	...	...	...	...	...	...	...	...
University of Pennsylvania, Department of Medicine, Philadelphia.	26	24	2	...	...	12	2	...	...	...	...	...	...	3	1
				2	0	2	0	3	0	3	0	2	0	4	0

Jefferson Medical College, Philadelphia.....	69	58	11	2	0	5	2	1	37	2	.....	23	6
Hahnemann Medical College and Hospital, Philadelphia.....	8	5	3	.....	.....	5	3	1	0	.....	.....	2	0
Medico-Chirurgical College of Philadelphia.....	4	1	3	.....	.....	.....	.....	.....	3	2	.....	1	1
Woman's Medical College of Pennsylvania, Philadelphia.....	3	3	.....	.....	.....	1	0	.....	1	0	.....	1	0
Medical College of the State of South Carolina, Charleston.....	74	61	13	.....	.....	.....	.....	.....	6	1	67	12	0
Medical Department University of Nashville and Vanderbilt University, Nashville.....	27	18	9	9	1	.....	.....	.....	12	8	0	3	0
Medical Department University of Tennessee, Nashville.....	5	4	1	2	0	.....	.....	.....	.....	2	1	1	0
Memphis Hospital Medical College, Memphis.....	4	3	1	4	1	.....	.....	.....	.....	.....	.....	.....	.....
Meberly Hospital Medical Department of Central Tennessee College, Nashville.....	5	3	2	2	0	.....	.....	.....	.....	3	2	.....	.....
Medical Department University of Vermont, Burlington.....	3	3	.....	1	0	1	0	.....	.....	.....	.....	1	0
University of Virginia, Medical Department, Charlottesville.....	62	61	1	.....	.....	.....	.....	.....	12	0	.....	50	1
Medical College of Virginia, Richmond.....	76	66	10	.....	.....	.....	.....	.....	3	0	.....	73	10
.....	1,188	898	285	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trinity Medical College, Toronto.....	2	2	.....	.....	.....	2	0	.....	.....	.....	.....	.....	.....
Medical Department, Queen's University, Kingston.....	7	4	3	.....	.....	7	3	.....	.....	.....	.....	.....	.....
McGill University, Faculty of Medicine, Montreal.....	8	6	2	1	0	7	2	.....	.....	.....	.....	.....	.....
Medical Department, University of Victoria, Toronto.....	1	1	1	.....	.....	1	1	.....	.....	.....	.....	.....	.....
University of Manitoba, Winnipeg.....	1	1	.....	.....	.....	1	0	.....	.....	.....	.....	.....	.....
.....	19	13	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Royal Frederik's University, Christiania, Norway.....	3	3	.....	.....	.....	3	0	.....	.....	.....	.....	.....	.....
University of Berlin, Germany.....	3	2	1	.....	.....	3	1	.....	.....	.....	.....	.....	.....
University of Heidelberg, Germany.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	0
University of Utrecht, Holland.....	1	1	.....	.....	.....	1	0	.....	.....	.....	.....	.....	.....
University of Copenhagen, Denmark.....	1	1	.....	.....	.....	1	0	.....	.....	.....	.....	.....	.....
Royal Karolinska Mediko-Kirurgiska Institutet, Stockholm, Sweden.....	1	1	1	.....	.....	1	1	.....	.....	.....	.....	.....	.....
University of Upsala, Sweden.....	1	1	.....	.....	.....	1	0	.....	.....	.....	.....	.....	.....
University of Bucharest, Roumania.....	1	1	.....	.....	.....	1	0	.....	.....	.....	.....	.....	.....
University of Padua, Italy.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Royal College of Physicians and Surgeons, Dublin, Ireland.....	1	1	.....	.....	.....	1	0	.....	0	.....	.....	.....	.....
St. George's Hospital, London, England.....	1	1	1	.....	.....	1	0	.....	.....	.....	.....	1	0
King's College, London, England.....	1	1	1	.....	.....	1	.....	.....	.....	1	1	1	1
.....	16	12	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colleges unknown.....	5	4	1	.....	.....	.....	.....	.....	.....	.....	.....	5	1
Non-graduates.....	112	41	71	2	2	5	5	.....	77	46	.....	28	18
Incomplete examinations.....	5	.....	5	.....	.....	5	5	.....	.....	.....	.....	.....	.....

\* Examinations of 1889 and a portion of 1890.

## INSTITUTIONS REPRESENTED.

In United States.....	77
Canadian.....	5
Foreign.....	12
	<hr/> 94

## PERCENTAGES OF REJECTIONS.

	graduate candidates;	per cent. rejected,	Non-graduates.
Alabama.....102	graduate candidates;	7.84.....	
Minnesota.....218	"	29.81.....	80%
New Jersey.....11	"	9.09.....	
North Carolina.....273	"	20.64.....	59.87%
South Carolina.....170	"	28.82.....	
Virginia.....349	"	29.51.....	64.29%
1,183 Graduates U. S. colleges; percentage rejected.....			24.09%
19 Canadian.....			31.57%
15 Foreign.....			25%
108 Non-graduates.....			62.03%

The following table is inserted for purposes of comparison :

Results of the Prussian State Examinations, 1890.	Berlin.....	Bonn.....	Breslau.....	Göttingen.....	Greifswald.....	Halle.....	Kiel.....	Königsberg.....	Marburg.....	Total.....
Second examinations*.....	70	10	15	9	37	20	7	4	9	181
New examinations.....	147	81	57	46	83	46	79	42	32	613
Total.....	217	91	72	55	120	66	86	46	41	794
Marked "sufficient".....	49	13	20	15	27	19	17	15	9	184
" " "good".....	79	60	16	29	54	26	55	21	17	357
" " "very good".....	2	3	2	3	1	.....	6	1	4	22
Total.....	130	76	38	47	82	45	78	37	30	563
Rejected.....	87	15	34	8	38	21	8	9	11	231
Per cent. rejected.....	40.09	16.48	47.22	14.54	31.66	31.81	9.3	19.56	26.82	29.09

**NOTE.**—Looking simply at the percentage of rejected candidates, it would seem that the graduates of American schools have done as well before the State Boards of Examiners as the applicants before the Prussian Commissioners. But a study of the German method of examining (given in this Report) will show that candidates in this country are not subjected to as severe tests as are candidates in Germany.

A careful examination of the foregoing tables will show that there are marked differences as to the severity of the examinations held by the State Boards, or else that the graduates going from certain colleges before certain boards are much better qualified than the average of the graduates of those schools. It is a fact that the examination papers vary greatly, and the table is not a positive index of the work of the schools represented. To correct these differences and have more uniform examinations there should be a meeting of the examining boards of the different states, and and some system adopted by which examination papers may be exchanged.

\*Rejected previous year.



The work of the boards may be facilitated in doubtful cases if they will refer to the pages of this REPORT for the status of the colleges represented by applicants.

It is a matter of importance that the work of these examining boards should be as uniform as possible, in order to bring about the best results so far as medical education and the regulation of the practice of medicine are concerned. The difficulties incident to divided and limited jurisdictions would thus be overcome, and the work made broader and more national in its character. Unless this is done, owing to the frequent changes of residence by medical men, repeated examinations become onerous, and in some cases work hardship. This is one of many good reasons for trying to secure coöperation and uniformity of action in issuing and recognizing certificates of examination by the various boards.

If this course is adopted, it will furnish facilities for the investigation of the character of applicants when removing to other states, as experience has taught that graduates having diplomas from some of the best medical colleges, or those who have passed a good examination, occasionally become the greatest professional frauds. Knowledge of the history of these men, thus obtained, would assist in preventing their being licensed in other states, and would exercise a supervision over all, which would do much towards upholding the *morale* of the profession.

The laws under which these boards work are different in some respects, and the conditions of examination differ. In the case of at least twenty schools the results of the examinations give too much or too little credit in the table. Some of the applicants are recent graduates, and others have been in practice for some time.

It has been the practice of this BOARD to recognize the certificates of examination issued by other Boards.

The following tables are interesting:

STANDING IN EACH SECTION OF THE APPLICANTS REJECTED SEPTEMBER 3D AND 4TH, 1890, BY THE MEDICAL EXAMINING BOARD OF VIRGINIA, AND THE COLLEGES FROM WHICH THEY RECEIVED DIPLOMAS.

The standard of requirements for license is an average mark of 75 per cent. on the whole. If, however, an applicant receives less than 33½ per cent. in any one of the eight Sections, he is rejected.

[This Table is introduced solely for the purpose of indicating the branches of study in which the greatest deficiencies of preparation of the applicants are most noticeable. In addition, it should be remarked that had it been required to rate the applicants on ordinary correctness of English grammar, at least one-third of those who passed satisfactory examinations on the required branches of medical study would have received very low markings, and far more than one-half of those rejected showed, in their examination papers, lamentable ignorance of English composition, spelling, etc.—Secretary of the Virginia board.]

## MARKS OF CANDIDATES REJECTED BY THE VIRGINIA BOARD.

INSTITUTIONS OF GRADUATION.	Chemistry.....	Anatomy .....	Hygiene and Medi- cal Jurisprudence..	Physiology .....	Materia Medica and Therapeutics.....	Obstetrics and Gynecology .....	Practice .....	Surgery.....	Average .....
University of Georgetown, Washing- ton, D. C.....	68	38	95	80	80	82	78	32	69%
Jefferson Medical College.....	20	35	92	75	79	74	75½	75	66%
Southern Medical College, Atlanta, Ga. ....	35	60	100	76	75	42	75	48	51%
King's College, London, England .....	50	65	100	93	72	39	75	50	69%
University of the City of New York..	57	38	100	76	84	82	94	43	71%
Atlanta Medical College .....	43	75	71	75	72	60	80	49	65%
College of Physicians and Surgeons, Baltimore .....	38	65	89	85	75	62	79	65	69%
Howard University, Washington, D. C. ..	60	55	100	63	70	80	83	22	66%
Howard University, Washington, D. C. ..	59	65	78	60	90	47	97	14	61%
Non-graduate .....	75	73	92	90	90	72	75	24	73%
Non-graduate .....	35	43	92	86	70	75	77½	80	66%
Jefferson Medical College (examined by New Jersey Board) .....	51	67	71½	84	85½	72	69	51	68%
Average for graduates.....	48	56	89.6	76.7	78.2	64.1	80.6	44.9	

It is suggested that the boards of examiners prepare tables of this kind at each examination for purposes of comparison.

The next table shows the marks obtained by the successful candidates before the New Jersey Board, October 9 and 10, 1890.

NAME OF INSTITUTION.	Materia Medica and Therapeutics .....	Obstetrics and Gynecology .....	Practice of Medicine	Surgery and Surgical Anatomy .....	Anatomy .....	Physiology .....	Chemistry .....	Histology, Pathology and Diseases of the Eye and Ear.	Hygiene and Medical Jurisprudence.	Total average—Percentage.....
1 University of Padua.....	95.	75.1	80.1	51.	.....	.....	.....	.....	.....	75.3
2 Hahnemann Medical College, Philadelphia.....	99.	96.	94.1	80.	.....	.....	.....	.....	.....	92.2
3 University City of New York, Medical Department.....	98.	92.	88.1	80.	89.	86.6	96.8	65.5	62.5	84.2
4 University of Pennsylvania.....	100.	99.	98.9	95.	97.	94.	100.	95.	99.	97.5
5 University of Pennsylvania.....	100.	81.5	88.	75.	77.	83.	100.	97.5	78.5	86.7
6 College of Physicians and Surgeons, Baltimore .....	84.	92.	89.5	75.	.....	.....	.....	.....	.....	85.2
7 New York Medical College and Hospital for Women....	88.5	82.5	83.	80.	90.	84.5	75.	90.	76.6	83.3
8 Jefferson Medical College .....	85.	99.9	94.5	60.	.....	.....	.....	.....	.....	84.8
9 University City of New York.	90.5	81.	81.8	64.	72.	80.5	84.	54.5	75.6	75.9
10 University of Pennsylvania.....	96.	39.	87.5	75.	79.5	97.	95.	93.	93.	90.5
Mean .....	93.6	89.8	88.6	73.5	84.1	87.7	91.8	82.6	80.8	

Applicants before the New Jersey Board are divided into three classes, which are given different examinations. See the New Jersey law, page 95.

**PRELIMINARY EDUCATION.**—Special attention is called to the fact that in some of the largest universities in this country courses preliminary to the study of medicine are now offered—the University of Pennsylvania, Cornell, Yale, Princeton, Lake Forest and Northwestern Universities, Johns Hopkins and the University of Wisconsin. That it is wise for students to take such courses before beginning the study of medicine there can be no doubt—as there can be no doubt that the day is past when the strictly classical course is entirely sufficient to fit any one for the study of medicine. It is interesting to note in this connection that the emperor of Germany has fallen in line with modern thought and has recently declared against the excessive time and labor expended upon the classical course. Harvard University has made arrangements by which the students intending to study medicine can take a special A. B. course in three years. An attempt has been made to establish a course preparatory to the study of medicine at the University of Michigan, but the scheme did not succeed. The plan was as follows:

OUTLINE OF THE PROPOSED MEDICAL PREPARATORY COURSE.

FIRST YEAR.

First Semester.		Second Semester.	
German .....	4	German.....	4
French.....	4	French.....	4
General chemistry .....	5	Laboratory work in general chemistry...	2
Trigonometry.....	3	English.....	2
	16	Mathematics .....	4
			16

SECOND YEAR.

First Semester.		Second Semester.	
German or French.....	2 or 3	French or German .....	4
General biology.....	5	General biology .....	5
Physics.....	5	Physics.....	5
Qualitative chemistry.....	5	Logic.....	2
	18	Rhetoric.....	2
			18

THIRD YEAR.

First Semester.		Second Semester.	
Vertebrate morphology.....	7	Vertebrate embryology.....	5
Organic chemistry.....	5	Physiological chemistry .....	7
Histology and physiology.....	3	Electives .....	2 to 6
Psychology .....	3		18
	18		

Students who enter the Department of Medicine and Surgery will not be recommended for a Bachelor's degree until they have completed the required three years' work in that department. Those who desire to obtain the Bachelor's degree in less than six years must remain in the Department of Literature, Science and Arts and complete the required number of courses in that department.

The three years' course of the Department of Medicine and Surgery is outlined below:

## FOURTH YEAR.

First Semester.		Second Semester.	
<i>Lectures and Recitations.</i>		<i>Lectures and Recitations.</i>	
Osteology .....	3	Descriptive anatomy .....	3
Materia medica .....	3	Materia medica .....	3
Physiology .....	3	Physiology .....	3
Hygiene .....	3	Physiological chemistry .....	3
Toxicology .....	2	Electro-therapeutics .....	1
Pharmacy .....	1	Medical jurisprudence .....	2
	15		15

*Laboratory Work*, throughout the year, in practical anatomy, practical hygiene, advanced histology and practical physiology.

## FIFTH YEAR.

First Semester.		Second Semester.	
<i>Lectures and Recitations.</i>		<i>Lectures and Recitations.</i>	
Theory and practice .....	2	Theory and practice .....	2
Surgery .....	3	Surgery .....	3
Diseases of children .....	2	Descriptive anatomy .....	2
Descriptive anatomy .....	2	Therapeutics .....	2
Therapeutics .....	2	Pathology .....	2
Pathology .....	2	Gynecology .....	2
Recitations on lectures .....	2	Recitation on lectures .....	2
	15		15

*Laboratory Work*, throughout the year, in practical anatomy, practical hygiene and practical pathology.

## SIXTH YEAR.

First Semester.		Second Semester.	
<i>Lectures and Recitations.</i>		<i>Lectures and Recitations.</i>	
Theory and practice .....	3	Theory and practice .....	3
Surgery .....	3	Surgery .....	3
Gynecology .....	3	Obstetrics .....	3
Ophthalmology .....	2	Ophthalmology, laryngology and otology .....	2
Diseases of mind and nervous system .....	2	Dermatology and syphilography .....	2
Dermatology and syphilography .....	2	Diseases of mind and nervous system .....	2
	15		15

*Laboratory Work and Clinical Work*, throughout the year, in surgery, practice, ophthalmology, otology, diseases of the nervous system, gynecology, obstetrics, physical diagnosis, operative surgery and obstetrics, minor surgery and bandaging.

Such a plan is undoubtedly a good one, and the better because it offers the B. Sc. instead of the B. A. degree. Such a course as the one offered by the University of Wisconsin should undoubtedly be accepted as one of the four years of medical study, but not as the equivalent of one of the three courses of lectures, though it should be accepted in lieu of one course of medical lectures when *four courses of lectures* are required, as must be the case during the present decade. As can be seen from this REPORT there

is a marked increase in matriculation requirements as compared with last year, and more attention is being given by the literary colleges to an education for the study of medicine. The facilities for obtaining a higher medical education are increasing yearly, and it is hoped that the day is not far distant when the standard of medical education will be as high in this as in any other country.

#### FOUR YEARS' STUDY AND THREE COURSES OF LECTURES.

There can be no longer any doubt that the movement for four years of medical study and three courses of lectures, with higher preliminary education, will be successful. At the meeting of the American Medical Association in Nashville, in May, 1890, the American Medical College Association was formed and adopted the following:

#### RULES GOVERNING THE ADMISSION OF COLLEGES TO MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

1. That the colleges shall require a graded course of instruction covering a period of not less than three courses of lectures of six months duration each before graduation.
2. That oral and written examinations be required of all students.
3. That a thorough course of laboratory instruction be maintained in chemistry, histology and pathology.
4. A preliminary entrance examination, consisting of:
  1. A composition, written in English, of not less than two hundred words.
  2. The translation of easy Latin prose.

It is provided, however, that students be allowed one year to make up any deficiency of this examination.

3. An examination in higher arithmetic.
4. An examination in elementary physics.

It is provided, however, that candidates who are graduates or matriculates of recognized colleges of literature, science and arts, or graduates of normal schools supported by the different states, be exempt from the provisions of this examination.

By resolution it was determined that the colleges entitled to representation in this convention shall enforce the above curriculum at the commencing of the session of 1892-93.

At the meeting of the American Institute of Homœopathy, at Waukesha, Wis., on June 20, 1890, the Institute adopted the following recommendations of its Intercollegiate Committee:

On and after the fall of 1892, in all colleges represented in the Intercollegiate Committee of the American Institute of Homœopathy the term of study required for graduation shall be at least four years, which shall include attendance upon not less than three terms of six months each.

No person, unless he present a diploma or certificate of graduation from an accredited university, college, academy or high school, or a teacher's certificate which shall be approved by the faculty as equivalent to the examinations required, shall be admitted to the second year of study, and the first course of lectures in any of the colleges represented in this committee, without having passed a written examination upon the following subjects:

1. English composition, by writing at the time of examination an essay of not less than two hundred words, from which may be judged the writer's proficiency in grammar, spelling and writing.
2. Arithmetic as far as square root.



3. Geography, physical and political, as much as is contained in advanced school geographies.

4. History, such an outline of the history of modern civilized nations, especially of the United States, as is contained in ordinary manuals of history.

5. Latin, sufficient to read easy prose and to give a fair comprehension of scientific terms and formula.

6. Physics, such as is comprised in Balfour Stewart's "Primer of Physics."

7. Biology and physiology, as much as is comprised in the briefer course of Martin's "Human Body."

8. Chemistry, as comprised in Miller's "Elementary Chemistry."

9. Botany as found in an elementary manual.

It shall be understood that the first of these four years of study shall have been devoted to the preliminary medical studies, as outlined by this committee, and that, upon successfully passing the above examination, the student shall have fulfilled the requirements of the first year of medical study.

All the homœopathic medical colleges in the United States except the Kansas City Homœopathic Medical College are in the Intercollegiate Committee of the Institute.

The following eclectic medical schools now require four years' study and three full courses of medical lectures:

Bennett College of Eclectic Medicine and Surgery, Chicago.

American Medical College, St. Louis.

California Medical College.

Eclectic Medical College of the City of New York.

Eclectic Medical Institute, Cincinnati.

In addition to the colleges marked in this REPORT "Diplomas not recognized," or "Diplomas recognized conditionally," and the obviously fraudulent institutions, the BOARD in 1890 recognized conditionally the diplomas of 25 colleges because of non-compliance with the schedule of minimum requirements. Before being granted certificates the graduates of these schools were required to supplement their applications with satisfactory evidence and by examination in the branches in which their collegiate education was deficient.

The following institutions have adopted, or will do so at the dates set opposite their titles, the requirements of longer terms of study, as a condition precedent to graduation:

California Medical College, 4 years' study with session of.....	1891
Bennett College of Eclectic Medicine and Surgery, Chicago, 3 courses of lectures and 4 years' study.....	1890-91
Medical College of Indiana, 3 courses of lectures and 4 years' study	1890-91
Physio-Medical College of Indiana, 4 " " " "	1890-91
Fort Wayne College of Medicine, 3 " " " "	1890-91
Dep't of Medicine and Surgery, University of Mich., 4 annual courses of lectures	1890-91
Homeopathic Medical College of Missouri, 3 courses of lectures and 4 years' study	1890-91
American Medical College, St. Louis, " " " "	1890-91
Dartmouth Med. Col., New Hampshire, " " " "	1891
Eclectic Med. Col. City of New York, " " " "	1890-91
Eclectic Med. Institute, Cincinnati, " " " "	1890-91
Toledo Medical College, " " " "	1890-91
National Normal University, Ohio, " " " "	1890-91

Chicago Homeopathic Medical College, 3 courses of lectures now and 4 years' study after.....				1890-91
Med. Dep't University of Wooster, 3 courses of lectures 1890, and 4 years' study				1891
Rush Medical College, 3 courses of lectures and 4 years' study after.....				1890-91
Chicago Medical College, 4 years' study after.....				1890-91
Hahneman Medical College, Chicago, 3 courses of lectures and 4 years' study after				1890-91
Woman's Medical College, Chicago, " " " " " "				1890-91
Physio-Medical Institute, Chicago, 4 years' study after.....				1890-91
Central Col. Phys. and Surgs., Indianapolis, 3 courses lectures and 4 years' study after .....				1890-91
Indiana Eclectic Medical College, 3 courses lectures and 4 years' study after.....				1890-91
Eclectic Col. Phys. and Surg., Indianapolis, 3 courses of lectures and 4 years' study after.....				1890-91
Medical Department State University of Iowa, 4 years' study after				1890-91
Homeopathic Medical Department, State University of Iowa, 4 " " "				1890-91
Iowa Eclectic Medical College, 3 courses of lectures and 4 " " "				1890-91
College of Medicine and Surgery, Minneapolis, 4 " " "				1890-91
College of Homeopathic Medicine and Surgery, Minneapolis, 4 " " "				1890-91
Missouri Med. Col., 3 courses of lectures with session 1890-91 and 4 " " "				1890-91
St. Louis Medical College, 4 " " "				1890-91
St. Louis College of Phys. and Surgs., 3 courses of lectures and 4 " " "				1890-91
University Med. Col. of Kansas City, 3 " " "				1890-91
Ensworth Medical College, 3 " " "				1890-91
Beaumont Hospital Medical College, 3 " " "				1891-91
Medical College of Ohio, 3 " " "				1890-91
Starling Medical College, 3 " " "				1890-91
Homeopathic Hospital College, Cleveland, 3 courses of lectures with 1890-91, and 4 years' study after.....				1890-91
Cincinnati College of Med. and Surg., 3 courses of lectures and 4 years' study after				1890-91
Miami Medical College, 3 " " "				1890-91
Northwestern Ohio Medical College, 3 " " "				1890-91
Woman's Med. College, Cincinnati, 3 " " "				1890-91
Western Pennsylvania Med. College, 3 " " "				1890-91
New York Homeopathic Medical College, 4 " " "				1891-92
New York Medical College and Hospital for Women, 4 " " "				1891-92
Hahnemann Medical College, Philadelphia, 4 " " "				1891-92
Boston University School of Medicine, 4 courses of lectures .....				1890-91
Pulte Medical College, Cincinnati, 4 " " "			with	1892-93
Columbus Medical College, 3 courses of lectures and 4 " " "				1892-93
Leonard Medical School, 4 years' graded course since .....				1882
Gross Medical College, Denver, 3 courses of lectures with session				1890-91
Kansas Medical College, 3 " " "				1890-91
Kansas City Homeopathic Medical College, 3 " " "				1890-91
Cotner University, Lincoln, Nebraska, 3 " " "				1890-91
Western Reserve Medical College, 3 " " "				1890-91
Cleveland Medical College, 3 " " "				1890-91
Jefferson Medical College, 3 " " "				1890-91
Medical College, State of South Carolina, 3 " " "				1890-91
Medical Department, University of Vermont, 3 " " "				1891
University of Spokane Falls, 3 " " "				1891
College of Physicians and Surgeons, Keokuk, 3 " " "			after	1890-91
Keokuk Medical College, 3 " " "				1890-91
University of Maryland, Department of Medicine, 3 " " "				1890-91
Northwestern Medical College, St. Joseph, 3 " " "				1890-91
University of the City of New York, 3 " " "				1890-91
Medical Department, University of Buffalo, 3 " " "				1890-91
Bellevue Hospital Medical College, 3 " " "				1890-91

During the year the list of colleges that now require or will require within one or two years more courses and time of study, has grown considerably. There are 34 colleges that now or will soon require four years' study and three courses of lectures, 11 that now or will soon require

four years' study, 4 that have or will soon have four courses, and 17 that will require three courses of lectures in the fall of 1891 or 1892, exclusive of those having that requirement now. Thus the list of colleges in the United States that require but two courses and have made no provision for longer study, is reduced to 21.

The Chicago Medical College was the first medical college in this country to adopt the three years' graded course of study, as is shown by the following:

The following is a correct copy of action taken at a meeting of the faculty of the Chicago Medical College on the 4th day of June, 1868.

"It was voted that we divide our curriculum of instruction into three successive courses of instruction, corresponding to the three years of study, as shown in the following schedule.

*"Junior Course.*—Descriptive anatomy, physiology and histology, inorganic chemistry, materia medica and therapeutics, dissection.

*"Middle Course.*—General pathology and pathological anatomy, surgical anatomy and operations of surgery, organic chemistry and toxicology, public hygiene, medical jurisprudence, clinic instruction in the hospital.

*"Senior Course.*—Principles and practice of medicine, principles and practice of surgery and military surgery, obstetrics and diseases of women and children, diseases of the respiratory and circulatory organs, clinical instruction in the hospital.

It was also voted that each course of winter lectures be of six months' duration, and each summer course of three months.

It was voted that every student applying for matriculation be required to show, either by certificate, or by examination, that he possesses a good English education, including the first series of mathematics and the elements of natural sciences."

H. A. JOHNSON,  
President of the Chicago Medical College.

In this movement of advancing the standard of medical education and regulating the practice of medicine, much assistance is derived from the work of various state boards of medical examiners. An impetus has been given by the formation of the American Medical College Association. The National Institute of Homeopathy and the National Eclectic Medical Association have endorsed the requirement of four years' study, as they have already done that of three annual courses of lectures.

Several boards, having authority similar to the ILLINOIS BOARD, have already adopted the requirement in this respect, and those that have not already done so, will in a short time co-operate in this movement.

The potency of this factor will be appreciated when it is considered that these boards directly control the recognition of diplomas in an area embracing about 41,000,000 people, and indirectly in almost the entire area of the United States; and that a number of them exercise jurisdiction in the new States and Territories.

The movement for a higher standard of medical education has now acquired a momentum that will probably result in the control of medical education and the regulation of medical practice in every State and Territory (except, perhaps, Alaska) during the present decade. The indications are that in the course of another year at least 100 colleges in this country will require four years' study.

REGISTRATION OF STUDENTS.—With four years' study and three courses of lectures assured, it seems proper that the different boards of medical examiners and the colleges should coöperate in establishing some system of registration of medical students before they enter college, in order that the fourth year of study may not be mere form. By a system of registration, the colleges and boards can know just how long any particular student has been engaged in the study of medicine. Such a system is in use in Great Britain, Canada, and several foreign countries.

Under the schedule of two-year courses and three years' study the earliest age at which a student can be graduated is 21 years. The addition of one year each to the time of study and the college term would seem to justify the limitation of the minimum age of graduation to 22 years. This is a matter that the boards of examiners and the colleges would do well to take under consideration.

The following table shows the age at graduation or license of 5,719 practitioners, as obtained from the records of the BOARD:

AGE.	UNITED STATES.		Canada.....	England....	Germany....	Switzerland..
	Male.	Female.				
19.....	9	.....	.....	.....	.....	.....
20.....	79	2	.....	.....	.....	.....
21.....	233	5	12	4	9	.....
22.....	431	11	8	6	6	3
23.....	506	10	9	4	15	.....
24.....	507	14	12	5	13	2
25.....	496	15	10	2	12	3
26.....	409	15	6	2	10	.....
27.....	378	11	7	2	7	1
28.....	322	18	4	2	2	1
29.....	255	21	2	2	2	.....
30.....	218	15	1	2	5	.....
31.....	178	16	2	.....	4	.....
32.....	175	4	.....	.....	1	.....
33.....	161	9	4	.....	3	.....
34.....	128	18	.....	.....	2	.....
35.....	128	12	4	.....	3	.....
36.....	94	12	.....	.....	2	.....
37.....	81	9	1	1	.....	.....
38.....	67	4	.....	.....	1	.....
39.....	44	7	.....	.....	.....	.....
40.....	47	10	.....	.....	.....	.....
41.....	29	6	.....	.....	.....	.....
42.....	41	6	.....	.....	.....	.....
43.....	25	5	.....	.....	.....	.....
44.....	22	5	.....	.....	1	.....
45.....	21	3	.....	.....	.....	.....
46.....	14	3	.....	.....	.....	.....
47.....	17	2	.....	.....	.....	.....
48.....	10	3	.....	.....	.....	.....
49.....	13	5	.....	.....	.....	.....
50.....	13	2	.....	.....	.....	.....
51.....	10	2	.....	.....	.....	.....
52.....	11	1	.....	.....	.....	.....
53.....	5	1	.....	.....	.....	.....
54.....	5	.....	.....	.....	.....	.....
55.....	4	.....	.....	.....	.....	.....
56.....	6	.....	.....	.....	.....	.....
57.....	3	.....	.....	.....	.....	.....
58.....	6	1	.....	.....	.....	.....
59.....	3	.....	.....	.....	.....	.....
60.....	3	.....	.....	.....	.....	.....
62.....	5	.....	.....	.....	.....	.....
65.....	2	.....	.....	.....	.....	.....

This table shows that diplomas have been granted at an earlier age in this than in any other country, and also to persons of more advanced age. In the latter case many of the graduates attended one course of lectures, went into practice and graduated after longer or shorter periods of practice. This custom has almost entirely disappeared at this time, owing to the laws in the different States. In the United States it is sometimes the case that young men, after obtaining an academic education go into business or teach school in order to make money to attend medical lectures. Again, many young men that intended to study medicine went into one of the armies when the war broke out, and studied medicine after the war. The passage of medical practice acts in some of the States caused many that had no diplomas to attend lectures and graduate.

Attention is called to the inexact manner in which the titles of medical colleges are given by some of the state medical authorities. The list of medical colleges whose diplomas are registered in Tennessee (as published by the Secretary) contains several names of colleges that have never existed, and in many cases the titles of colleges that have existed or now exist are wrong. This was doubtless the fault of the county clerks who registered the diplomas, but at the same time it is important, in view of the fact that there are so many fraudulent diplomas in existence, that the exact title of the institution or authority issuing the diploma or the license be given. Mistakes in titles have occurred in every list of colleges sent to the Secretary from different Boards of Examiners.

In the cases of some colleges it has been found that the lists of matriculates have been padded, in order to show that the college is more prosperous than it really is or else to reduce the percentage of graduates to matriculates. Such a course reacts upon the college. The padding is almost surely discovered, and suspicion is at once aroused that the college is resorting to other methods that are not strictly honorable. Akin to this is the practice of issuing announcements without printed lists of matriculates. This always causes serious annoyance to the graduates of such schools when they wish to obtain the license to practice in Illinois.

Another noticeable feature of the college announcements in this country is that the good work of the school is generally in inverse proportion to the amount of vain-glorious boasting in the announcements. Should individual members of the medical profession make use of such boastful and "puffing" language in regard to themselves as is used in some college announcements in regard to the colleges and their teachers, they would be unhesitatingly set down as quacks and unworthy of membership in a scientific body of any kind. Until the contrary is proved or asserted it is generally taken for granted that a teacher in a medical college is a gentleman and qualified to teach his particular branch. The first step towards casting a doubt upon such an assumption is a printed puff of the teacher in his college announcement, as the following:



The nervous system is one of the most intricate and important systems in the human body.\* The Professor has a peculiar fitness for combatting the mysteries connected with this subject, and has accepted the position of professor of this department.

These important branches of medical science are in charge of a man of wide reputation as an obstetrician. His long and successful experience as a lecturer and teacher in this department is well known, and eminently fits him for the position. His lectures will be plain, practical and instructive, embracing everything both in theory and practice that is important to be understood.†

Such boasting is not confined to heralding the qualities of the teachers. One of the various forms in which it appears is that of insisting that the college has a charter. No one ever has a doubt that a school doing good work has a charter. When a school has to sing praises to its charter in its announcement, there is good reason to suspect that the charter is the best feature of the institution.

A third form in which this boastful spirit appears is that of describing the location and appointments of the college, of claiming unexampled prosperity (sometimes when the college is about to die of inanition), and of describing long known and used methods of instruction as new and peculiar to the college.

Extravagant and untrue assertions in the pages of an announcement are usually accompanied by a high percentage of graduates to matriculates, bad work, low standard both for entrance and graduation, and not infrequently by non-recognition of the diplomas or rejection by boards of examiners.

There are colleges in this country that sometimes write to students of other colleges, offering them lower rates or shorter terms, or both. Such action is not honorable. It is quite as dishonorable as for a private practitioner to solicit the patients of another practitioner, and is doubtless stimulated by a desire for large classes and by the great competition between some of the colleges.

\*A fact so universally admitted that it seems scarcely necessary to call attention to it. This is taken from the announcement of an —— college. Other professors are spoken of in a like manner.

†From the announcement of a —— school, in which similar pen-portraits are drawn of other teachers and their work.

## RESUME OF MEDICAL PRACTICE ACTS IN THE DIFFERENT STATES AND TERRITORIES.

**ALABAMA.**—Examination by the State Board of Examiners, or by a county board of examiners. Law passed in 1877.

**ARIZONA.**—Register diploma with county recorder. Passed in 1881.

**ARKANSAS.**—Registration of diploma or examination by the state or a county board of examiners (latter inoperative.) Law passed 1881.

**CALIFORNIA.**—Certificate on diploma from a "college in good standing," or examination by one of the three boards of examiners. Passed in 1876.

**COLORADO.**—Certificate on diploma of college "in good standing," or examination by the State Board of Medical Examiners. Passed in 1881.

**CONNECTICUT.**—No law except against advertising itinerants.

**DELAWARE.**—Registration of diploma in a county clerk's office. Passed in 1883.

**DISTRICT OF COLUMBIA.**—Endorsement of diploma or examination by committee of the District Medical Society (practically inoperative.) Passed in 1838.

**FLORIDA.**—Examination by one of the state or district boards of medical examiners. Passed 1884, 1889.

**GEORGIA.**—Registration of diploma in the office of the clerk of the superior court. Passed in 1881.

**IDAHO.**—Record diploma at county seat. Passed in 1887.

**ILLINOIS.**—Certificate on diploma from college "in good standing" or examination before the State Board of Health. Passed in 1877, 1887.

**INDIANA.**—Registration of diploma in county clerk's office. Passed 1885.

**INDIAN TERRITORY.**—*a*) Cherokee Nation: Examination by the Board of Examiners of the Nation. Passed 1878. *b*) Choctaw Nation: Certificate on diploma or examination by the board of examiners of the Nation. *c*) Creek Nation: No law.

**IOWA.**—Certificate on diploma from college "in good standing" or examination by the State Board of Medical Examiners. Passed 1886.

**KANSAS.**—No law.

**KENTUCKY.**—Ten years' practice, or registration and endorsement of diploma of a legally chartered college by secretary of the State Board of Health. Passed 1874, 1888, 1890.

**LOUISIANA.**—Recording diploma before county clerk or justice of the peace after endorsement of same by State Board of Health, which is "required to certify to the diploma of any medical institution of credit and respectability without regard to its system of therapeutics." Passed 1882, 1887.

**MAINE.**—No law.

**MARYLAND.**—Verification of diploma of college "in good standing," or examination by State Board of Health (law inoperative). Passed 1888.

**MASSACHUSETTS.**—No law.

**MICHIGAN.**—Record diploma in County Clerk's office. Passed 1883.

**MINNESOTA.**—Examination by State Board of Medical Examiners. Passed in 1883 and 1887.

**MISSISSIPPI.**—Examination by a County Board of Medical Censors. Passed 1882.

**MISSOURI.**—Certificate on diploma from college in "good standing" or examination by State Board of Medical Examiners. Passed 1883.

**MONTANA.**—Ten years' practice, certificate on diploma from a college "in good standing," or examination by State Board of Medical Examiners. Passed in 1889.

**NEBRASKA.**—Register in the office of the County Clerk. Passed 1881, 1883.

**NEVADA.**—Register diploma before the County Recorder. Passed in 1875.

NEW HAMPSHIRE.—License from the Board of Censors of Medical Society.

NEW JERSEY.—Examination by the State Board of Medical Examiners. Passed 1880, 1888, 1890.

NEW MEXICO.—Endorsement of diploma or examination by Territorial Board of Examiners. Passed 1882.

NEW YORK.—Examination by one of the State Boards of Examiners. after September 1, 1891. Endorsement of diploma until September 1, 1891. Law passed 1880, 1888, 1890.

NORTH CAROLINA.—Examination by the State Board of Medical Examiners. Passed 1859, 1885.

NORTH DAKOTA.—Examination by the State Board of Medical Examiners. Passed 1890.

OHIO.—Law inoperative.

OREGON.—Certificate on diploma from a college "in good standing," or examination by the State Board of Medical Examiners. Passed 1889.

PENNSYLVANIA.—Registration of diploma before county prothonotary after endorsement (of diploma from college outside of State) by some medical college within the State. Passed 1881.

RHODE ISLAND.—No law.

SOUTH CAROLINA.—Examination by the State Board of Medical Examiners. Passed 1881, 1888.

SOUTH DAKOTA.—Certificate on diploma, or examination by the Territorial Board of Health. Territorial law, 1884.

TENNESSEE.—Registration after certificate on diploma of college "in good standing," or examination by State Board of Medical Examiners. Passed 1889.

TEXAS.—Registration after endorsement of diploma, or examination by a District Board of Examiners. (Practically inoperative.) Passed 1876, 1879.

UTAH.—No law.

VERMONT.—Registration after endorsement of diploma, or examination by a Board of Medical Censors appointed by either State Medical Society. Passed 1880.

VIRGINIA.—Examination by State Medical Examining Board. Passed 1884, 1888.

WASHINGTON.—Examination by State Medical Examining Board. Passed 1890.

WEST VIRGINIA.—Certificate on diploma of "reputable" college, or examination by the State Board of Health. Passed 1882.

WISCONSIN.—Examination or endorsement of diploma by the censors of any State or county society. Laws of 1878, 1881.

WYOMING.—File record of diploma with registrar of deeds. Passed 1886.

In Minnesota, Montana, North Dakota and Washington every applicant for license to practice must have attended three courses of lectures. The same will be required by the California Boards after April 1, 1891, the Colorado Board after July 1, 1893, by the Illinois and Iowa Boards after the session of 1890-91, and by the Boards of Examiners of New York after September 1, 1891. There will probably be three more State examining boards in the next year.

INSTRUCTION IN STATE MEDICINE.—It seems proper to refer here to the fact that by a recent law no one can be appointed a medical officer of health in Great Britain unless he have a special diploma in public health. Among the teaching institutions in London will be noticed the College of State Medicine, and diplomas in public health are now given by several British teaching institutions. It would be a step forward if some of our better endowed universities would establish departments of State medicine. It is interesting to note that the contract has been signed for the

erection of a building, to cost \$50,000, for hygienic instruction, as an annex to the University of Pennsylvania. For this institution the University of Pennsylvania and the profession are indebted to Mr. Henry C. Lea, of Philadelphia. When it is completed the University will be in a position to offer thorough instruction in hygiene and state medicine. Hygiene is now taught in all the medical colleges in the United States and Canada except the fourteen following:

- Gross Medical College, Denver, Colorado.**
- National Medical College, Washington, D. C.**
- Medical Department, National University, Washington, D. C.**
- Medical College of Georgia, Augusta, Ga.**
- Atlanta Medical College, Atlanta, Ga.**
- Woman's Medical College of Georgia and Training School for Nurses, Atlanta, Ga.**
- Louisville National Medical College, Louisville, Ky.**
- Detroit College of Medicine, Detroit, Mich.**
- Leonard Medical School, Raleigh, N. C.**
- Woman's Medical College of Cincinnati, Cincinnati, O.**
- Tennessee Medical College, Knoxville, Tenn.**
- Hannibal Medical College of Memphis, Tenn.**
- Texas Medical College and Hospital, Galveston, Texas.**
- University of Virginia**

It is to be regretted that in many colleges the amount of instruction in hygiene is so small as to be of but little value.

THE DEGREE OF M. D. IN THE UNITED STATES.—No one making a careful study of this REPORT and of the pages given to foreign institutions, can fail to be struck with the cheapness of the American degree, in regard to its cost in time and money and as regards the requirements for it. Throughout the civilized world the value of an article is measured by its cost and by the time necessary to produce it. With the exception of Belgium this is the only country in the world where the license to practice and the M. D. degree can be had after not more than three years of study. A distinguished professor in one of our colleges has asserted that American students learn faster than foreign youths, and therefore do not require so long a term of study—they can learn just as much in a shorter time. Whatever truth there might be in this if the preliminary education of American medical students, as a class, was as good as that of foreign students, the assertion is obviously erroneous when certain facts are borne in mind. The preliminary education of the average American student is much less than that of the foreign one. It requires a certain amount of time for a person to acquire habits of scientific and logical thought. In the case of many American medical students these habits are not formed when he begins the study of medicine. We mistake the name of the thing for the thing itself. Many medical men of world-wide reputation, especially in Great Britain, have not the M. D. degree, but the lack of it has not embarrassed them in any

way. The American degree is too cheap in many cases, especially as regards the amount of money it costs, often on account of the competition for students. The average fees for the eleven London schools are, exclusive of the examination fees, £118 5s.; for the provincial schools £98. In addition, each student has to pay from 10s. to £5 matriculation to one of the degree-granting bodies; from £1 to £15 for the first examination; from £1 to £10 for the second; from £2 to £15 for the first degree or qualification examination, and from £5 to £15 for the second qualification examination. In some of the colleges in the United States all the fees do not amount to \$200, and in at least one the whole course of study and the diploma can be had for \$138. A careful study of the systems of education in foreign countries shows that a large part of the time and much of the money are spent in acquiring practical knowledge of medicine by actual work in hospitals, and this work is tested by practical examinations, such as are too infrequent in this country. Too often the American graduate attends his first case of labor after he begins practice. Such is not the case abroad. The same is true of other conditions that physicians and surgeons are called upon to treat. The defects in the American system of medical education, then, are: 1. Too little preliminary education, and thus a lack of ability to grasp scientific principles. 2. Too much didactic work by the teachers. 3. Too little clinical work by the students. 4. Too few tests of practical work. 5. Too short a time of actual work and study. Increasing the preliminary qualifications and lengthening the time of study will remedy the other defects, and will kill off the useless and low-class schools.

The following tables will show the progress made towards higher medical education in the United States during the past ten years. It will be seen that not much progress was made during the fifty years preceding 1880, though it is true that in 1868 the three years' graded course movement was begun. The colleges began to adopt this course gradually, but in 1880 there were but nine colleges in the United States that had adopted it, while in 1890 the number of schools having it was 62. In this way the repetitional course, so long in vogue, is being gradually abolished, and from present indications there will not be many colleges that will continue this course after a year from this time. It will be seen also that in other respects the teaching and the facilities for clinical instruction have been greatly improved, as necessitated by the progress in medical science. The table is now much more complete than ever before, since it gives the record of all the matriculates and graduates for ten years.

## SUMMARY OF INSTITUTIONS AND STUDENTS.

I.—INSTITUTIONS.		Physician.....	Homeopath....	Eclectic.....	Physio-Med...	Miscellaneous.	Fraudulent....	Totals.....
Total number of Medical Institutions embraced in this report.....		220	26	37	8	7	18	316
— — in the United States.....		198	26	37	8	7	18	294
— — in Canada.....		22						22
Total number of examining and licensing bodies which do not give instruction.....		29	3	2				34
— — in the United States.....		27	3	2				32
— — in Canada.....		2						2
Total number of Colleges now in existence.....		124	13	9	2			148
— — in the United States.....		111	13	9	2			135
— — in Canada.....		13						13
Total number of Institutions now extinct.....		96	13	28	6	7	18	168
— — in the United States.....		87	13	28	6	7	18	159
— — in Canada.....		9						9
Total number of Colleges which now exact certain educational qualifications as a condition of matriculation.....		104	13	10	2			129
— — exacting such qualifications before the session of 1883-4.....		41	4					45
Total number of Colleges requiring attendance on three or more courses of lectures as a condition of graduation..		66	13	5	1			85
— — which required such attendance before the session of 1883-4.....		21	1					22
Total number of Colleges which have chairs of hygiene.....		99	13	10	1			123
— — which formerly taught this branch.		32	7	3				42
Total number of Colleges which have chairs of medical jurisprudence.....		95	12	10	2			119
— — which formerly taught this branch.		49	8	4				61
Total number of Colleges for women only.....		8	1					9
— — in the United States.....		6	1					7
— — in Canada.....		2						2
Total number of Colleges for both sexes.....		31	7	5	2			45
Total number of Colleges for colored students...		5						5
— — both white and colored students...		1						1

## Summary of Institutions and Students—Continued.

## II.—DURATION OF LECTURE TERMS.

					Schools.		Weeks.	
Average duration of lecture terms—					1890-1	144	26.3	
—	—	—	—	—	1889-0	139	25.5	
—	—	—	—	—	1888-9	131	25.1	
—	—	—	—	—	1887-8	131	24.9	
—	—	—	—	—	1886-7	129	24.8	
—	—	—	—	—	1885-6	131	24.4	
—	—	—	—	—	1884-5	129	24.3	
—	—	—	—	—	1883-4	128	24.5	
—	—	—	—	—	1882-3	126	23.5	

Sessions of 1882-3. 1883-4. 1884-5. 1885-6. 1886-7. 1887-8. 1888-9. 1889-0. 1890-1.

No. of schools having terms of five months or more.....	84	79	79	78	74	68	65	63	33
No. of schools having terms of six months or over.....	42	49	50	52	55	63	66	76	111

## III.—MATRICULATES—GRADUATES.

					Physician..	Homeopath	Eclectic....	Phys.-Med.	Miscellaneous.....	Totals and percent-ages.....
Total number of Matriculates—sessions of—					1880-1.....	10,285	1,234	826	54	12,399
—	—	—	—	—	1881-2.....	10,857	1,251	946	60	13,114
—	—	—	—	—	1882-3.....	10,913	1,238	909	52	13,130
—	—	—	—	—	1883-4.....	10,825	1,162	722	52	12,780
—	—	—	—	—	1884-5.....	10,228	1,032	618	54	11,970
—	—	—	—	—	1885-6.....	10,600	1,065	591	48	12,318
—	—	—	—	—	1886-7.....	11,278	1,064	587	41	12,980
—	—	—	—	—	1887-8.....	12,291	1,091	575	41	14,009
—	—	—	—	—	1888-9.....	13,470	1,101	604	57	15,232
—	—	—	—	—	1889-0.....	14,608	1,128	661	51	16,448
Total number in the United States—					1880-1.....	9,750	1,244	826	54	11,864
—	—	—	—	—	1881-2.....	10,195	1,251	946	60	12,452
—	—	—	—	—	1882-3.....	10,057	1,238	909	52	12,274
—	—	—	—	—	1883-4.....	10,059	1,162	722	52	12,014
—	—	—	—	—	1884-5.....	9,245	1,032	618	54	10,987
—	—	—	—	—	1885-6.....	9,532	1,065	591	48	11,250
—	—	—	—	—	1886-7.....	10,116	1,064	587	41	11,818
—	—	—	—	—	1887-8.....	10,854	1,091	575	41	12,572
—	—	—	—	—	1888-9.....	11,981	1,101	604	57	13,743
—	—	—	—	—	1889-0.....	13,044	1,128	661	51	14,884
Total number in Canada—					1880-1.....	535	.....	.....	.....	535
—	—	—	—	—	1881-2.....	662	.....	.....	.....	662
—	—	—	—	—	1882-3.....	856	.....	.....	.....	856
—	—	—	—	—	1883-4.....	766	.....	.....	.....	766
—	—	—	—	—	1884-5.....	983	.....	.....	.....	983
—	—	—	—	—	1885-6.....	1,068	.....	.....	.....	1,068
—	—	—	—	—	1886-7.....	1,162	.....	.....	.....	1,162
—	—	—	—	—	1887-8.....	1,437	.....	.....	.....	1,437
—	—	—	—	—	1888-9.....	1,489	.....	.....	.....	1,489
—	—	—	—	—	1889-0.....	1,564	.....	.....	.....	1,564
Percentages of Graduates to Matriculates—					1880-1.....	31.8	33.3	33.1	38.8	32.2
—	—	—	—	—	1881-2.....	35.3	31.5	33.7	36.6	34.5
—	—	—	—	—	1882-3.....	31.7	36.1	30.1	44.2	32.1
—	—	—	—	—	1883-4.....	31.6	35.4	31.8	32.6	32.4
—	—	—	—	—	1884-5.....	31.7	32.5	32.2	40.7	31.9
—	—	—	—	—	1885-6.....	32.5	35.1	34+	58.3	32.8
—	—	—	—	—	1886-7.....	28.9	33.1	34+	36.5	29.5
—	—	—	—	—	1887-8.....	28.8	35.3	32.9	41.4	29.5
—	—	—	—	—	1888-9.....	29.2	34+	33.2	52.6	29.8
—	—	—	—	—	1889-0.....	29+	34.5	30.8	41.1	29.4
Percentages in the United States—					1880-1.....	32.5	33.3	33.1	33.8	32.7
—	—	—	—	—	1881-2.....	37+	31.5	33.7	36.6	35.8
—	—	—	—	—	1882-3.....	32.7	36.1	30.1	44.2	33+
—	—	—	—	—	1883-4.....	32.5	35.4	31.3	32.6	32.8
—	—	—	—	—	1884-5.....	32.4	32.5	33.2	40.7	32.2
—	—	—	—	—	1885-6.....	33.5	35.1	34+	58.3	33.8
—	—	—	—	—	1886-7.....	30.1	33.1	34+	36.5	30.6
—	—	—	—	—	1887-8.....	29.6	35.3	32.7	41.4	30.3
—	—	—	—	—	1888-9.....	30.5	34+	33.2	52.6	31+
—	—	—	—	—	1889-0.....	29.7	34.5	30.8	41.1	30.1

## Summary of Institutions and Students—Continued.

III.—MATRICULATES—GRADUATES.					Physician..	Homeopath	Eclectic....	Phys.-Med.	Miscellaneous.....	Totals and percent- age.....
Percentages in Canada—1880-1.....					19.2	.....	.....	.....	.....	19.2
—	—	—	—	1881-2.....	15.8	.....	.....	.....	.....	15.8
—	—	—	—	1882-3.....	19.1	.....	.....	.....	.....	19.1
—	—	—	—	1883-4.....	19.9	.....	.....	.....	.....	19.9
—	—	—	—	1884-5.....	16.9	.....	.....	.....	.....	16.9
—	—	—	—	1885-6.....	21.6	.....	.....	.....	.....	21.6
—	—	—	—	1886-7.....	18.5	.....	.....	.....	.....	18.5
—	—	—	—	1887-8.....	22.7	.....	.....	.....	.....	22.7
—	—	—	—	1888-9.....	18.8	.....	.....	.....	.....	18.8
—	—	—	—	1889-0.....	23+	.....	.....	.....	.....	23+
Total number of Graduates—session—1880-1.....					3,278	412	274	21	.....	3,985
—	—	—	—	1881-2.....	3,855	395	319	22	.....	4,571
—	—	—	—	1882-3.....	3,462	445	274	23	11	4,215
—	—	—	—	1883-4.....	3,427	412	226	17	9	4,091
—	—	—	—	1884-5.....	3,245	338	199	22	20	3,824
—	—	—	—	1885-6.....	3,433	374	201	28	7	4,043
—	—	—	—	1886-7.....	3,265	352	200	15	3	3,835
—	—	—	—	1887-8.....	3,546	386	188	17	5	4,142
—	—	—	—	1888-9.....	3,957	375	201	30	.....	4,543
—	—	—	—	1889-0.....	4,237	391	204	21	.....	4,853
Total number in the United States—1880-1.....					3,175	412	274	21	.....	3,882
—	—	—	—	1881-2.....	3,730	395	319	22	.....	4,466
—	—	—	—	1882-3.....	3,298	445	274	23	11	4,051
—	—	—	—	1883-4.....	3,274	412	226	17	9	3,988
—	—	—	—	1884-5.....	3,078	338	199	22	20	3,657
—	—	—	—	1885-6.....	3,202	374	201	28	7	3,812
—	—	—	—	1886-7.....	3,050	352	200	15	3	3,629
—	—	—	—	1887-8.....	3,219	386	188	17	5	3,815
—	—	—	—	1888-9.....	3,657	375	201	30	.....	4,263
—	—	—	—	1889-0.....	3,876	391	204	21	.....	4,492
Total number in Canada—1880-1.....					103	.....	.....	.....	.....	103
—	—	—	—	1881-2.....	105	.....	.....	.....	.....	105
—	—	—	—	1882-3.....	164	.....	.....	.....	.....	164
—	—	—	—	1883-4.....	153	.....	.....	.....	.....	153
—	—	—	—	1884-5.....	167	.....	.....	.....	.....	167
—	—	—	—	1885-6.....	231	.....	.....	.....	.....	231
—	—	—	—	1886-7.....	215	.....	.....	.....	.....	215
—	—	—	—	1887-8.....	327	.....	.....	.....	.....	327
—	—	—	—	1888-9.....	280	.....	.....	.....	.....	280
—	—	—	—	1889-0.....	361	.....	.....	.....	.....	361

From the foregoing tables it will be seen that for the session of 1887-88, as compared with that of 1886-87, there was an increase of 1,034 in the total number of matriculates; in 1888-89, compared with session of 1887-88, there was an increase of 1,187; and in the session of 1889-90 as compared, with the previous session, there was an increase of 1,216. In the session of 1887-88 in the United States there was an increase of 759 matriculates, and for session of 1888-89, compared with previous year, there was an increase of 1,135 students, a greater increase than has occurred within the last seven years, and in 1889-90 as compared with the previous year, there was an increase of 1,141. The increase of students in the United States, however, has been only 3,020 for ten years. The smallest number for any one year in the ten was 10,987 in 1884-85, a reduction due to the enforcement of the schedule of minimum requirements after 1882-83.

The total number of graduates was a decrease of 48 for the session 1888-89, compared with that for the session 1881-82, but in 1889-90 there was an increase of 282 over 1881-1882. In the United States there were



26 more graduates in 1889-90 than in 1881-82. In Canada there has been an increase in the same period of 256 graduates.

There has been a slight decrease in the percentage of graduates to matriculates for the session of 1889-90, as compared with that of 1888-89, and the percentage is now lower than ever before. This is more marked in the United States, as since the session of 1881-82 the percentage has been yearly decreasing.

When the requirement of four years of study and three annual courses of lectures is carried into effect, the decrease in percentage will again occur, and continue until it reaches an average of 25 per cent. As a general rule the graduates to matriculates in individual schools is a good criterion of the character of the work done; there are, however, exceptions, in which (a) more rigid preliminary requirements, and (b) the desire of students to avail themselves of superior clinical advantages that are possessed by some, but not by all colleges, tends to swell their percentage.

This exceptional result obtains more especially in these schools which heretofore have required but two courses of lectures before graduation.

In anticipation of the increased length of time of study with the additional requirements before graduation, the probabilities are that there will be an increase of students and also of graduates in the next year. The influence and results accomplished by the requirement of four years' study and three courses of lectures will not become fully apparent until the end of the session 1892-93.

By way of contrast to the good results already accomplished there has been an addition during the past year of five new colleges to the list, a greater increase than occurred for ten years previously, except in 1889 when eight new schools came into existence. In this connection it becomes a serious question to consider in regard to any new school, whether it is properly equipped from a teaching, a laboratory and a clinical standpoint. Can it be said with truth that there is any necessity for additions to the present large number of medical schools, some of which are not now properly provided for, and therefore hold out inducements with results which tend so much to cast a stigma upon medical training and medical diplomas in the United States? Some of the colleges now in existence have not adequate clinical facilities. One school had not enough dissecting material in 1889-90, and some of its students were graduated without having dissected. More attention should be paid to securing endowments for medical institutions now existing, giving them more and better facilities to instruct, than to the creation of new schools inadequately endowed. This would be to the direct advantage of the public and profession, exerting a powerful influence in raising the standard of medical education in our country. We hope the day will come when the diplomas of all American Medical Schools will have recognition throughout the civilized world.

\*The craze for establishing medical colleges commenced in the United States about 1840, and continued uninterruptedly until 1880, when there was a lull, but it seems to have broken out again.

The chances of survival of new colleges will better appreciated when it is borne in mind that since 1850 there has been a mortality of three per year, and that at this time more is required of the graduates of such institutions than at any period in the history of medical education in this country.

THE following Tables show the number of *Matriculates* and of *Graduates* by *Schools* of practice, in attendance at the *Medical Colleges* of each *State* and of the *Dominion* of *Canada*, during the last ten sessions—1880-81 to 1889-90 inclusive. The percentages of graduates to matriculates, by schools of practice, are also given.

I.—MATRICULATES AND GRADUATES IN EACH STATE, 1880-81 TO 1889-90 INCLUSIVE.

ABBREVIATIONS: Physician, P.; Homeopath, H.; Eclectic, E.; Physio-Medical, P.-M.; Miscellaneous, Mis.; Matricula.es, M.; Graduates, G.

States.	Schools ....	Classes .....	SESSIONS.										Totals .....	Per cent.....
			1880-1.	1881-2.	1882-3.	1883-4.	1884-5.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.		
Alabama ..	P ....	M. G..	69 22	66 21	47 16	75 12	90 34	107 32	105 37	89 29	113 32	128 44	889 279	31.5
Arkansas .	P ....	M. G..	32 10	36 2	32 4	23 13	37 8	52 16	59 15	66 20	83 17	73 16	408 124	24.9
California.	P ....	M. G..	120 25	126 27	144 30	123 31	136 32	147 20	184 44	195 34	268 62	238 41	1,681 346	20.5
	H ....	M. G..	.....	.....	.....	23 6	17 7	24 10	12 6	21 9	18 10	10 4	125 52	41.6
	E ....	M. G..	31 11	25 10	32 11	30 9	26 5	24 14	28 7	24 8	39 8	41 6	300 89	29.6
Canada....	P ....	M. G..	535 103	662 105	856 164	766 153	983 167	1,068 231	1,162 215	1,437 327	1,489 280	1,564 361	10,522 2,106	20.+
Colorado...	P ....	M. G..	.....	15 5	21 5	30 5	37 6	31 12	26 3	70 15	71 19	92 18	396 88	22.2
Conn .....	P ....	M. G..	26 10	21 2	32 7	43 7	27 6	26 6	25 8	31 7	32 2	50 7	313 62	19.8
Dist. of C..	P ....	M. G..	168 23	173 31	193 45	202 43	215 51	245 39	232 42	267 55	346 62	343 70	2,384 461	19.3
Georgia...	P ....	M. G..	198 69	261 116	230 72	235 112	254 103	279 108	303 121	297 132	298 129	347 123	2,752 1,089	39.5
	E ....	M. G..	.....	81 24	67 18	62 17	69 13	63 10	50 22	57 21	40 19	46 16	535 160	29.9
Illinois ....	P ....	M. G..	788 234	820 247	923 295	813 284	799 277	771 291	736 254	804 235	872 260	990 297	8,316 2,674	32.1
	H ....	M. G..	282 125	392 146	422 174	393 152	369 115	357 144	310 131	291 127	311 132	344 130	3,471 1,376	39.6
	E ....	M. G..	127 51	113 38	147 52	159 50	143 37	122 50	125 43	116 37	97 36	101 30	1,250 424	33.9
	P.-M	M. G..	.....	.....	.....	.....	.....	18 10	20 8	15 7	21 10	15 5	89 40	44.9

I.—*Matriculates and Graduates*—Continued.

States.	Schools ....	Classes .....	SESSIONS.										Totals .....	Per cent. ....
			1880-1.	1881-2.	1882-3.	1883-4.	1884-5.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.		
Indiana ...	P ....	M . G ..	286 106	251 95	227 101	145 72	118 50	123 54	100 45	105 43	107 43	139 44	1,601 653	40.7
	P.-M	M . G ..	20 10	24 10	26 17	21 7	34 12	30 18	21 7	26 10	36 20	36 16	274 127	46.3
	E ....	M . G ..	37 12	19 11	24 7	31 10	35 16	37 22	19 10	22 10	21 8	49 15	294 121	41.1
Iowa .....	P ....	M . G ..	415 152	424 172	300 92	282 104	240 96	235 79	276 107	251 96	255 84	308 93	2,986 1,75	35.9
	H ....	M . G ..	60 16	46 15	44 12	35 12	33 10	29 10	35 14	32 13	29 9	32 10	375 121	32.2
	E ....	M . G ..	.....	25 7	38 8	65 16	54 15	31 10	49 17	27 12	18 8	29 9	336 102	30.3
Kansas ....	P ....	M . G ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	11	.....
Kentucky .	P ....	M . G ..	513 228	513 241	672 231	680 246	546 219	588 244	659 240	793 273	986 406	1,040 402	6,990 2,730	39.+
Louisiana .	P ....	M . G ..	204 41	220 56	212 73	212 70	192 64	208 78	216 57	277 73	269 78	307 93	2,317 683	29.4
Maine .....	P ....	M . G ..	115 30	104 28	94 28	99 33	66 14	85 20	84 20	86 21	71 24	81 16	885 234	26.4
	E ....	M . G ..	.....	23 3	38 14	24 7	9 10	25 5	.....	.....	.....	.....	139 39	28.+
Maryland .	P ....	M . G ..	328 143	392 175	392 129	638 220	675 248	616 255	649 210	597 196	687 217	759 222	5,733 2,015	35.1
Mass .....	P ....	M . G ..	275 60	282 88	263 84	287 65	294 65	294 70	301 91	320 78	332 65	331 80	2,979 746	25.+
	H ....	M . G ..	110 26	110 29	109 30	97 34	91 26	97 18	100 28	107 35	94 29	94 27	1,009 282	27.9
Michigan..	P ....	M . G ..	380 127	500 121	479 158	474 137	456 120	441 126	431 114	438 94	544 135	581 142	4,724 1,274	26.9
	H ....	M . G ..	88 23	71 15	57 17	55 20	34 6	49 17	60 14	73 13	71 21	71 21	629 167	26.5

States.	Schools . . . .	Classes . . . .	SESSIONS.										Totals . . . . .	Per cent. . . . .
			1880-1.	1881-2.	1882-3.	1883-4.	1884-5.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90		
Minnesota	P . . . .	M . . . . G . . . .	..... .....	25 5	58 4	59 7	59 21	91 25	109 13	104 17	85 17	104 20	694 129	18.5
	H . . . .	M . . . . G . . . .	..... .....	..... .....	..... .....	..... .....	..... .....	..... .....	20 2	26 4	13 4	8 1	67 11	16.4
Missouri..	P . . . .	M . . . . G . . . .	604 226	628 250	598 230	613 212	472 172	481 173	519 194	589 214	707 231	776 265	5,987 2,167	36.1
	H . . . .	M . . . . G . . . .	35 8	49 17	41 11	31 19	32 9	38 17	39 14	40 16	52 15	64 30	429 156	36.3
	E . . . .	M . . . . G . . . .	66 22	118 40	114 38	65 15	24 14	26 6	33 16	44 13	69 31	63 25	622 220	35.3
	Mis . . .	M . . . . G . . . .	..... .....	..... .....	18 11	19 9	38 20	14 7	10 3	11 5	..... .....	..... .....	110 55	50.
Nebraska..	P . . . .	M . . . . G . . . .	..... .....	33 8	40 9	35 7	56 14	51 14	24 7	24 10	23 7	26 4	302 80	26.4
	H . . . .	M . . . . G . . . .	..... .....	..... .....	..... .....	17 3	11 4	9 4	..... .....	..... .....	..... .....	..... .....	37 11	29.7
N. Hamp..	P . . . .	M . . . . G . . . .	91 43	76 28	80 40	40 18	52 13	55 15	56 19	64 26	67 20	98 25	679 247	36.3
N. Y. ....	P . . . .	M . . . . G . . . .	2,209 642	2,197 792	2,146 646	1,990 580	1,826 593	1,884 566	2,068 629	2,309 564	2,309 638	2,428 671	21,366 6,221	29.1
	H . . . .	M . . . . G . . . .	232 64	227 56	221 63	209 69	165 53	177 54	168 56	175 57	169 42	154 53	1,887 567	30.+
	E . . . .	M . . . . G . . . .	249 64	270 86	224 62	96 19	41 11	74 15	92 15	58 11	75 12	77 12	1,260 307	24.3
N. Carol'ia.	P . . . .	M . . . . G . . . .	..... .....	11 .....	11 .....	12 .....	17 .....	26 6	23 .....	31 5	42 7	53 6	231 24	10.4
Ohio .....	P . . . .	M . . . . G . . . .	902 300	933 390	924 319	816 282	717 254	693 256	757 226	751 241	898 300	896 305	8,286 2,872	34.6
	H . . . .	M . . . . G . . . .	219 67	208 69	197 86	156 56	136 60	137 42	154 39	153 64	168 48	163 51	1,691 573	33.8
	E . . . .	M . . . . G . . . .	316 114	272 100	225 64	190 83	193 78	189 69	191 70	227 76	245 79	255 91	2,308 824	35.7
	P-M . . .	M . . . . G . . . .	34 11	36 12	26 6	31 10	20 10	..... .....	..... .....	..... .....	..... .....	..... .....	147 49	33.3

I.—*Matriculates and Graduates—Continued.*

States.	Schools.....	Classes.....	SESSIONS.										Totals.....	Percent.....
			1880-1.	1881-2.	1882-3.	1883-4.	1884-5.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.		
Oregon....	P....	M.. G..	31 13	29 9	28 10	24 10	23 8	20 7	17 6	42 12	61 17	49 24	324 116	35.8
Penn.....	P....	M.. G..	1,153 340	1,135 391	1,088 376	1,168 348	1,022 312	1,080 379	1,195 352	1,267 388	1,376 443	1,480 431	11,964 3,766	31.4
	H....	M.. G..	208 83	148 57	147 52	138 41	144 48	148 58	166 48	173 48	186 65	188 64	1,646 564	34.2
S. C.....	P....	M.. G..	77 21	56 19	61 18	80 20	59 17	62 18	51 18	61 17	74 26	57 23	638 196	30.7
Tenn.....	P....	M.. G..	488 233	589 298	504 211	444 186	461 169	644 208	592 194	616 228	678 220	868 315	5,784 2,262	39.1
Texas.....	P....	M.. G..	.....	.....	.....	.....	.....	.....	.....	.....	.....	13 2	13 2	15.3
Vermont...	P....	M.. G..	171 50	190 85	151 36	230 100	191 78	163 62	185 53	182 58	187 59	206 48	1,856 619	33.3
Virginia...	P....	M.. G..	107 27	89 25	117 25	132 50	108 34	134 34	126 31	128 48	140 38	173 29	1,254 331	26.3
TOTALS....	P....	M.. G..	10,285 3,278	10,857 3,835	10,913 3,462	10,825 3,427	10,228 3,245	10,600 3,433	11,278 3,265	12,291 3,546	13,470 3,987	14,608 4,237	115,355 35,665	30.9
	P*...	M.. G..	9,750 3,175	10,195 3,730	10,067 3,298	10,059 3,274	9,245 3,078	9,532 3,202	10,116 3,050	10,854 3,219	11,981 3,657	13,044 3,876	104,833 33,559	32.+
	H*..	M.. G..	1,234 412	1,251 395	1,238 445	1,162 412	1,032 338	1,065 374	1,064 352	1,091 386	1,101 375	1,128 391	11,366 3,883	34.1
	E*..	M.. G..	826 274	946 319	909 274	722 226	618 199	591 201	587 200	575 188	604 201	661 204	7,039 2,286	32.4
	P.M.*	M.. G..	54 21	60 22	52 23	52 17	54 22	48 28	41 15	41 17	57 30	51 21	510 216	42.3
	Mis*	M.. G..	.....	.....	18 11	19 9	38 20	14 7	10 3	11 5	.....	.....	110 55	50.
	Matri's* Grad's....	.....	11,864 3,882	12,452 4,466	12,274 4,051	12,014 3,938	10,987 3,657	11,250 3,812	11,818 3,620	12,572 3,815	13,743 4,263	14,884 4,492	123,858 39,999	32.2
G. Totals..	Matri's .. Grad's....	.....	12,399 3,985	13,114 4,571	13,130 4,215	12,780 4,091	11,970 3,821	12,318 4,043	12,980 3,835	14,009 4,142	15,232 4,543	16,448 4,853	134,380 42,105	31.2

\* In the United States.

The schedule of minimum requirements of the ILLINOIS STATE BOARD OF HEALTH went into effect after the session of 1882-83. Taking the periods of three years each of 1880-83 and 1883-86 it is seen that the most marked effect was in Illinois, Indiana, Iowa, Michigan, Missouri and Ohio, which had 2,257 fewer students and 727 fewer graduates in the second than the first period, mainly owing to the matriculation requirements of the BOARD, though these states gained about 500,000 population in the second period of three years. In four states with an increase of population of 833,784 in the past ten years, there was an increase of 1,487 students out of a total increase of 3,020 for the United States while the total increase of population was over 12,000,000.

By making a careful study of the following table and of the colleges enumerated in the REPORT the causes of the increase of students will be evident.

STATES.	Students in 1880 and 1881.....	Students in 1889 and 1890.....	Increase of students.....	Decrease of students.....	Population in 1890..	Population in 1880..	Increase in population.....
Alabama.....	69	128	59	.....	1,508,073	1,262,505	245,568
Arkansas.....	32	73	41	.....	1,125,386	802,525	322,860
California.....	120	289	169	.....	1,204,002	864,694	339,308
Connecticut.....	26	50	24	.....	745,861	622,700	123,161
District of Columbia.....	168	343	175	.....	229,796	177,624	52,172
Georgia.....	198	393	195	.....	1,834,366	1,542,180	292,186
Illinois.....	1,197	1,450	253	.....	3,818,536	3,077,871	740,668
Indiana.....	343	224	.....	119	2,189,030	1,978,301	210,729
Iowa.....	475	369	.....	106	1,906,729	1,624,615	282,114
Kentucky.....	513	1,040	527	.....	1,855,436	1,648,690	206,746
Louisiana.....	204	317	103	.....	1,116,828	939,946	176,882
Maine.....	115	81	.....	34	660,261	648,936	11,325
Maryland.....	328	759	431	.....	1,040,431	934,943	105,488
Massachusetts.....	385	425	* 40	.....	2,233,407	1,783,085	450,322
Michigan.....	468	652	184	.....	2,083,792	1,636,937	452,855
Missouri.....	705	903	198	.....	2,677,080	2,168,380	508,700
New Hampshire.....	91	98	7	.....	375,827	346,991	28,836
New York.....	2,690	2,659	.....	31	5,981,951	5,082,871	899,063
Ohio.....	1,471	1,313	.....	158	3,666,719	3,198,062	468,657
Oregon.....	31	49	18	.....	312,490	174,768	137,722
Pennsylvania.....	1,361	1,678	307	.....	5,248,574	4,282,891	965,683
South Carolina.....	77	57	.....	20	1,147,961	995,577	151,584
Tennessee.....	488	868	380	.....	1,763,723	1,542,359	221,364
Vermont.....	171	206	35	.....	332,205	332,286	81*
Virginia.....	107	173	66	.....	1,648,911	1,512,565	136,346

\* Decrease.

In May, 1867, there was held in Cincinnati a convention of delegates from the medical schools of the country, and resolutions were passed recommending changes in the methods of study, advising four years of study instead of three. "These propositions," says Dr. H. A. Johnson, "no doubt faithfully represented the opinions of those teachers when at a distance from their institutions, but they had altogether a different set of ideas when the question was presented in its financial aspects at home.\*

\*History of the Chicago Medical College, 1870.

Nothing came of this Cincinnati convention. Ten years afterwards at the meeting of the American Medical Association in Chicago, in June, 1877, representatives from thirty-one medical colleges in the country formed the Association of American Medical Colleges, and adopted a constitution, by-laws and articles of confederation. The articles prescribed that at and after the session of 1879-80 the regular session should not be less than twenty weeks, that the term of study should be not less than three years, and the number of sessions not less than two.

At its meeting in 1880 the Association increased the requirements to three courses and agreed upon preliminary examinations as condition of admissions after the session of 1882-83. This Association dissolved in 1881, when the time approached for the increased requirements.

In October, 1880, the ILLINOIS STATE BOARD OF HEALTH adopted its schedule of minimum requirements, to go into effect after the session of 1882-83. In adopting these requirements the ILLINOIS BOARD simply enforced what the colleges had already and repeatedly acknowledged to be a necessity. This schedule, which is now in force, is as follows:

#### SCHEDULE OF MINIMUM REQUIREMENTS.

I. CONDITIONS OF ADMISSION TO LECTURE-COURSES.—1. Credible certificate of good moral standing. 2. Diploma of graduation from a good literary and scientific college, or high school—a first-grade teacher's certificate. Lacking this—a thorough examination in the branches of a good English education, including mathematics, English composition, and elementary physics and natural philosophy.

II. BRANCHES OF MEDICAL SCIENCE TO BE INCLUDED IN THE COURSE OF INSTRUCTION.—1. Anatomy. 2. Physiology. 3. Chemistry. 4. Materia-Medica and Therapeutics. 5. Theory and Practice of Medicine. 6. Pathology. 7. Surgery. 8. Obstetrics and Gynecology. 9. Hygiene. 10. Medical Jurisprudence.

III. LENGTH OF REGULAR GRADUATING COURSES.—1. The time occupied in the regular courses or sessions from which students are graduated shall not be less than five months, or twenty weeks, each. 2. Two full courses of lectures, not within one and the same year of time, shall be required for graduation with the degree of Doctor of Medicine.

IV. ATTENDANCE AND EXAMINATION OR QUIZZES.—1. Regular attendance during the entire lecture courses shall be required, allowance being made only for absences occasioned by the student's sickness, such absence not to exceed twenty per centum of the course. 2. Regular examinations or quizzes to be made by each lecturer or professor daily, or at least twice each week. 3. Final examinations on all branches to be conducted, when practicable, by competent examiners other than the professors in each branch.

V. DISSECTION, CLINICS AND HOSPITAL ATTENDANCE.—1. Each student shall have dissected during two courses. 2. Attendance during at least two terms of clinical and hospital instruction shall be required.

VI. TIME OF PROFESSIONAL STUDIES.—This shall not be less than three full years before graduation, including the time spent with a preceptor, and attendance upon lectures or at clinics and hospital.

VII. INSTRUCTION.—The college must show that it has a sufficient and competent corps of instructors, and the necessary facilities for teaching, dissections, clinics, etc.

Diplomas of colleges whose educational requirements and methods of instruction fall short of the above Schedule are not recognized as entitling their possessors to certificates authorizing them to practice in the State of Illinois. (This does not apply to diplomas issued prior to the sessions of 1883-84, but only to those issued at the close of said sessions and subsequently). The only way in which holders of such diplomas may legally enter upon practice in this State is by passing a satisfactory examination before the BOARD on the branches or subjects of the Schedule omitted.

This Schedule is, therefore, the test of the "good standing" of a medical college in Illinois. Only the colleges which come up to this minimum standard are accounted as in "good standing." To determine the status of any given institution, it is only necessary to compare the summary of the institution set forth in the following pages with the above Schedule.

At the April, 1886, meeting of the BOARD, the following preamble and resolution were adopted:

WHEREAS, The continuous graduation of forty-five (45) per cent. of the total number of matriculates of a medical college—due allowance being made for the average annual loss—must be accepted as *prima facie* evidence that, practically, every candidate is graduated without regard to competency or qualification; therefore, be it

*Resolved*, That no medical college be recognized as in good standing within the meaning and intent of the "Act to Regulate the Practice of Medicine in the State of Illinois," the aggregate graduates of which college amount to forty-five (45) per cent. of its aggregate matriculates during any period of five (5) years ending with a session subsequent to the session of 1885-86.

#### NEW REQUIREMENTS.

At the July, 1887, meeting of the BOARD, the following resolution was adopted:

*Resolved*, That the phrase, "medical colleges in good standing," in the first section of the "Act to Regulate the Practice of Medicine in the State of Illinois," approved June 16, 1887, is hereby defined to include only those colleges which shall, after the sessions of 1890-91, require four years of professional study, including any time spent with a preceptor, and three regular courses of lectures, as conditions of graduation, and shall otherwise conform to the Schedule of Minimum Requirements heretofore adopted by the BOARD.

At a meeting of the BOARD held at Chicago May 24, 1889, the following resolution was adopted:

*Resolved*, That by authority of the "Act to Regulate the Practice of Medicine in the State of Illinois," approved June 16, 1887, the following Schedule of Minimum Requirements for Schools of Midwifery be, and hereby is, adopted:

- I. Length of Regular Graduating Courses: The time occupied in the regular courses or sessions from which students are graduated shall amount to not less than six months.
- II. Instruction must include the following branches of medical science. 1. Anatomy of the pelvis, and of the generative organs of women. 2. Physiology of menstruation and conception. 3. The signs of pregnancy. 4. Mechanism of labor. 5. Management of normal labor. 6. Management of abnormal labor. 7. Puerperal hygiene and antiseptics. 8. Special care of the mother and infant.



# MEDICAL COLLEGES.

OF THE

## UNITED STATES AND CANADA--1765-1891.

---

EMBRACING the Titles; Locations; Addresses of Corresponding Officers; Organizations; Curricula of Study; Requirements for Admission and for Graduation; Fees; Number of Matriculates and of Graduates—of all Existing Medical Schools in the United States and Canada.

The Titles; Locations, Dates of Organization; Periods of Existence and other Historical data—of all Extinct Medical Schools in the United States and Canada.

Arranged Alphabetically as to States, and Chronologically as to dates of Organization.

---

### ALABAMA.

#### THE MEDICAL ASSOCIATION OF THE STATE OF ALABAMA.

JEBOME COCHRAN, M. D., Montgomery, Senior Censor.

The Board of Censors of the Medical Association of the State of Alabama, and the Boards of Censors of the several County Medical Societies in affiliation with the State Medical Association, are, under the law, the authorized Boards of Medical Examiners. The State Board is composed of ten members, elected by the State Association, and each County Board of five members, elected by the County Society. Diplomas of Medical Colleges confer no right to practice medicine in Alabama. Nothing does except the certificate of one of the examining boards, based upon actual examination of the applicants. The County Boards examine none but the graduates of reputable medical Colleges; the diplomas serving simply as a means for getting before the Boards. The State Board alone examines non-graduates. The rules for the government of the examining boards, including the standard of qualifications and the branches of medicine to be included in the examinations, are all prescribed by the State Association. The examinations are both oral and written, but the principal stress is placed on the written examination, which usually occupies about one week. The answers to the questions are valued according to their completeness and accuracy, and an aggregate of 75% out of a possible 100% is necessary to pass the applicant. The examination papers are carefully written and bound, and are filed in the State Board of Health office. They are all carefully reviewed by the State Board, which makes to the State Association a special report on the character of the examination of each separate applicant.

The Alabama law to Regulate the Practice of Medicine was enacted in 1877. It was applicable only in counties having medical societies holding charters from the State Association, and at the time of its enactment not more than one-half of the counties were thus organized. From year to year new societies have been organized, until in 1888 there was a medical society and a board of examiners in every county in the State. This system seems to be very complex, but in practice is found to work well. A large number of incompetent

and ignorant practitioners are still left in the State, because the law was not made retro-active; all who were actually engaged in practice at the time the law was put into operation and received *pro-fa* certificates without examination. These, in the course of time, will die out, and better men will take their places. The records show that from the beginning of the administration of the law the county boards have rejected on an average 20% of the applicants examined—or one in five—and all of them college graduates. The State Board has examined 28 non-graduates, of whom 6 passed and 22 were rejected; and 8 graduates, 5 of whom passed and 3 were rejected.

The following table shows the number of applicants that appeared before the State Board from January 1, 1889, to November 1, 1890, the number passed and rejected, and the colleges represented:

INSTITUTIONS REPRESENTED BY THE APPLICANTS BEFORE THE ALABAMA STATE BOARD OF MEDICAL EXAMINERS From January 1, 1889, to November 1, 1890.	1889.			1890.		
	Number of candidates from each college...	Certificates issued.....	Certificates refused.....	Number of candidates from each college...	Certificates issued.....	Certificates refused.....
Medical College of Alabama, Mobile.....	15	15	.....	8	7	1
Southern Medical College, Atlanta.....	8	8	.....	.....	.....	.....
Atlanta Medical College, Atlanta.....	4	4	.....	1	1	.....
University of Maryland, School of Medicine, Baltimore.	3	3	.....	.....	.....	.....
Louisville Medical College, Louisville.....	3	3	.....	4	4	.....
Vanderbilt University, Nashville.....	4	3	1	2	2	.....
Bellevue Hospital Medical College, New York.....	3	3	.....	1	1	.....
College of Physicians and Surgeons in the City of New York.....	3	3	.....	.....	.....	.....
Memphis Hospital Medical College, Memphis.....	3	3	.....	1	.....	1
Medical Department, University of Tennessee, Nashville.....	2	2	.....	.....	.....	.....
University of Pennsylvania, Department of Medicine, Philadelphia.....	2	2	.....	.....	.....	.....
University of Nashville, Nashville.....	2	2	.....	1	1	.....
Medical Department of Tulane University of Louisiana, New Orleans.....	2	2	.....	1	1	.....
Kentucky School of Medicine, Louisville.....	1	1	.....	.....	.....	.....
Rush Medical College, Chicago.....	2	1	1	1	1	.....
Albany Medical College, Albany.....	1	1	.....	.....	.....	.....
Medical Department, University of Vermont, Burlington	1	1	.....	.....	.....	.....
University Medical College of Kansas City.....	1	1	.....	.....	.....	.....
Pulte Medical College, Cincinnati.....	1	1	.....	.....	.....	.....
Howard University, Medical Department, Washington.	1	.....	1	1	.....	1
Cincinnati College of Medicine and Surgery, Cincinnati.	1	1	.....	.....	.....	.....
McHarry Medical Department of Central Tennessee College, Nashville.....	1	1	.....	1	1	.....
College of Physicians and Surgeons, Baltimore.....	1	1	.....	.....	.....	.....
Georgia College of Eclectic Medicine and Surgery, Atlanta.....	1	1	.....	.....	.....	.....
Beaumont Hospital Medical College, St. Louis.....	1	1	.....	.....	.....	.....
Chicago Homeopathic Medical College, Chicago.....	2	1	1	.....	.....	.....
Jefferson Medical College, Philadelphia.....	1	1	.....	1	1	.....
University of the City of New York, Medical Department	1	1	.....	.....	.....	.....
Leonard Medical School, Raleigh.....	1	1	.....	.....	.....	.....
Medical College of Ohio, Cincinnati.....	1	.....	1	.....	.....	.....
Western College of Homeopathic Medicine, Cleveland..	1	1	.....	.....	.....	.....
St. Louis Medical College, St. Louis.....	.....	.....	.....	1	1	.....
Long Island College Hospital, Brooklyn.....	.....	.....	.....	1	1	.....
Department of Medicine and Surgery of the University of Michigan, Ann Arbor.....	.....	.....	.....	1	1	.....
Miami Medical College, Cincinnati.....	.....	.....	.....	1	1	.....
McGill University, Faculty of Medicine, Montreal.....	.....	.....	.....	1	1	.....
Non-graduates.....	1	.....	1	1	.....	1
Totals.....	75	69	6	29	25	4

## GRAFFENBERG INSTITUTE.

## ALABAMA.

Chartered by the Legislature of Alabama in 1852 for a period of ten years. Some six or seven sessions were held, and the charter not being renewed expired by limitation in 1862. Says a correspondent; "The Institute itself was entirely regular—although on account of the want of clinical material, and the small number of teachers, it was considered as not strictly a first class medical college." The buildings of the Institute were burned during the war. The number of graduates is not known. There are supposed to be about twenty of them in Alabama, and but very few in other States. The Medical Association of the State of Alabama recognizes its degrees. [Information furnished by Dr. Jerome Cochran, Senior Censor, Medical Association of the state of Alabama.]

## MEDICAL COLLEGE OF ALABAMA.

MOBILE, Ala. GEO. A. KETCHUM, M. D., Dean, 7 N. Conception street.

ORGANIZED in 1859. Closed during the war and re-opened in 1868. There were no graduates during the years 1862-68, inclusive.

The faculty consists of nine professors, one demonstrator and one assistant.

COURSE OF INSTRUCTION: The regular course of lectures for the session of 1890-91 commenced October 27, 1890, and continues until the 27th of March, 1891. A preliminary course began October 26, 1890. A three years' graded course is recommended and provided for, without cost as to lecture tickets for the third year. After the middle portion of the term is reached, the faculty will establish a daily quiz.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and diseases of women and children, microscopy, ophthalmology and otology, histology, hygiene, medical jurisprudence, clinical and genito-urinary surgery and practical pharmacy. Examinations are held daily on the various lectures. Clinics at the hospital and the college dispensary.

REQUIREMENTS: For admission: **None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) attendance on two full courses of lectures and of dissections; 5) pass a satisfactory examination before the members of the faculty.

FEES: Matriculation (annually), \$5; lectures including hospital, \$75; dissecting, \$10; graduation, \$25; single tickets, each branch, \$10; practical pharmacy, \$10.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	47	16	34+
1883-84	75	12	16.
1884-85	90	34	37.7
1885-86	107	32	29.6
1886-87	105	37	35.2
1887-88	89	29	32.5
1888-89	113	32	28.3
1889-90	128	44	34.3

Percentage of graduates to matriculates for eight sessions reported, 31.2.

## SOUTHERN UNIVERSITY, MEDICAL DEPARTMENT.

GREENSBORO, Ala.

ORGANIZED in 1872.—Extinct. Last session closed in 1880.

## ARKANSAS.

## MEDICAL DEPARTMENT, ARKANSAS INDUSTRIAL UNIVERSITY.

LITTLE ROCK, Ark. R. G. JENNINGS, M. D., Secretary of the Faculty.

ORGANIZED in 1879. First class graduated in 1880. Classes have graduated each subsequent year.

The faculty consists of fourteen professors and lecturers, a demonstrator, and two pro-sectors.

**COURSE OF INSTRUCTION:** Lectures began November 5, 1890, and will continue twenty weeks. Five lectures will be delivered daily during the six days of the week. "A voluntary graded course of three years has been established from the organization of this college,"—but "students who prefer to continue their studies on the repetitional system can do so." Didactic and clinical lectures, practical work in the dissecting room, chemical and physiological laboratories, daily quizzes upon subjects of preceding lectures.

Lectures embrace practice of medicine, institutes and practice of surgery, obstetrics, diseases of women and children, physiology, general, descriptive and surgical anatomy, materia medica, therapeutics, hygiene, botany, clinical surgery, dermatology, medical chemistry, toxicology, ophthalmology, otology, diseases of the genito-urinary organs, physical diagnosis and clinical medicine, gynecology, meteorology and climatology.

**REQUIREMENTS:** For admission—Applicants must be eighteen years of age, and present a credible certificate of good moral character; a diploma of graduation from a good literary and scientific college or high school; a first-class grade teacher's certificate, or, lacking this, a thorough examination in the branches of a good English education, including mathematics, English composition and elementary physics or natural philosophy.

For graduation: 1) satisfactory evidence of good moral character; 2) age, twenty-one years; 3) a satisfactory certificate of having pursued the study of medicine for at least three years under a regular graduate, or licentiate and practitioner in good standing; 4) attendance two full courses of lectures, with thorough dissection of the whole body; 5) satisfactory examination; 6) thesis on some medical subject, or a full report of any of the clinics. Two years and nine months are accepted in lieu of three years' study, if the three years will expire not later than three months after graduation.

**FEES:** Matriculation, (paid once only), \$5; lectures, \$50; demonstrator, \$5; hospital, \$3; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates,	Graduates.	Percent.
1880-81	32	10	31.
1881-82	36	5	13.8
1882-83	32	4	12.5
1883-84	28	13	46.4
1884-85	37	8	21.6
1885-86	52	16	30.7
1886-87	59	15	25.4
1887-88	66	20	30.3
1888-89	83	17	20.4
1889-90	73	16	21.9

Percentage of graduates to matriculates for past ten years, 24.9.

## CALIFORNIA.

### BOARD OF EXAMINERS OF THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA.

SAN FRANCISCO, Cal., CHAS. E. BLAKE, M. D., Secretary, 200 Stockton Street.

Total number licentiates in Register March, 1890, 2,283.

The present medical law has been in force for nearly thirteen years, and, with few exceptions, all qualified practitioners of California have complied with its provisions. Attention is called to the following preamble and resolutions adopted January 4, 1888.

WHEREAS, the law to regulate the practice of medicine in the State of California provides that the Board of Examiners in the discharge of its official duties shall determine what colleges are in good standing, whose diplomas may be presented by applicants for certificates under the law;

AND WHEREAS, it is apparent that the protection of the public, and the best interests of the profession require a higher standard of medical education than that which is now adopted by many Medical Colleges,

Therefore, Resolved, That on and after April 1, 1891, the Board of Examiners of the Medical Society of the State of California will not grant certificates to practice medicine on diplomas issued after that date by Colleges which do not require that all candidates for graduation shall have studied medicine not less than three full years, and shall have attended not less than **three full regular courses of lectures** delivered during three separate years.

### BOARD OF EXAMINERS OF THE CALIFORNIA STATE HOMEOPATHIC MEDICAL SOCIETY.

SAN FRANCISCO, Cal. WM. BÖRIGKE, M. D., Secretary.

Total number of licentiates in Official Register is 382.

# BOARD OF EXAMINERS OF THE ECLECTIC MEDICAL SOCIETY OF THE STATE OF CALIFORNIA.

SAN FRANCISCO, Cal., GEO. G. GERE, M. D., Secretary, 112 Grant Avenue.

Total number of licentiates in Official Register is 314.

## COOPER MEDICAL COLLEGE.

SAN FRANCISCO, Cal. HENRY GIBBONS, Jr., M. D., Dean, 920 Polk street.

ORGANIZED in 1859 as the Medical Department of the University of the Pacific. Ceased to exist in 1864, but was revived in 1870, under the same name. In 1873 it became the Medical Department of the University College of San Francisco, and was given the specific designation of the Medical College of the Pacific. In 1882 the institution received its present name.—The first class was graduated in 1860. No classes were graduated in the years 1865-69, inclusive. A class was graduated in 1870, and in each subsequent year.

The faculty consists of twelve professors, two lecturers, a demonstrator of anatomy, a demonstrator of pathology, and five clinical assistants.

**COURSE OF INSTRUCTION:** Three annual summer courses and one intermediate course are required to complete the curriculum. The regular course begins June 1, and ends November 30; the intermediate course begins February 1, and ends April 30. During the first year the student attends all didactic lectures, but gives special attention to descriptive anatomy, physiology, chemistry, surgery, microscopy and practice of medicine, and is examined in these branches at the end of the term. In the second year, all lectures and clinics must be attended, and examinations in all branches are held at the close, those in descriptive anatomy, physiology and chemistry being final. All lectures and clinics must be attended during the third year, except lectures on chemistry and physiology, if examinations in these have been successfully passed. Special attention must be given to clinics. Final examinations, written and oral, in the third year.

The principal branches taught are: Principles and practice of medicine, clinical medicine and diagnosis; surgery, surgical anatomy, clinical and operative surgery; descriptive and practical anatomy; microscopy and histology; pathology with practical illustrations; obstetrics, diseases of women and children; gynecology; theoretical and practical physiology; ophthalmology, otology, didactic and clinical; chemistry; toxicology; materia medica and therapeutics; hygiene; insanity; medical jurisprudence; physical diagnosis; laryngoscopy.

**REQUIREMENTS:** For admission: eighteen years of age, an examination in English composition, physics, arithmetic and Latin rudiments (declension of nouns and grammar). Graduates of literary, scientific, medical, or pharmaceutical colleges or universities in good standing, graduates of high schools, and applicants who have passed the examination for admission to any recognized literary college or university, or who hold first-grade certificates from any public school board, as properly qualified teachers, on producing proper evidence of the same, are admitted to matriculation without examination.

A special preliminary examination in arts, required by the regulations of the General Council of Medical Education and Registration of the United Kingdom, may be had on application by those intending to finish their education in Great Britain, or obtain other qualifications in medicine or surgery.

For graduation: 1) good moral character; 2) twenty-one years of age; 3) three regular courses of lectures, and the intermediate course preceding the student's last year; 4) two courses of clinical instruction; 5) one course of practical anatomy, dissecting the entire subject; 6) satisfactory thesis; 7) successful passing of all examinations.

**FEES:** Matriculation, paid but once, \$5; lectures (three courses), \$260; single course, \$130; demonstrator, \$10; graduation, \$40. A charge of \$25 is made for each intermediate course, which amount is credited upon the succeeding regular course fees.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	59	9	15.2
1882	67	12	18
1883	83	19	22.9
1884	80	16	20
1885	83	19	22.7
1886	83	11	13.2
1887	102	28	27.4
1888	104	14	13.4
1889	123	41	33.3
1890	130	18	13.8

Percentage of graduates to matriculates for the past ten years, 20.4.

# MEDICAL DEPARTMENT, UNIVERSITY OF CALIFORNIA.

*Toland Medical College.*

SAN FRANCISCO, Cal. ROBERT A. McLEAN, M. D., Dean, 603 Merchant street.

ORGANIZED in 1863 as the Toland Medical College. Became connected with the University of California in 1872.

The faculty consists of thirteen professors, three assistants, one demonstrator, and the dispensary staff.

**COURSE OF INSTRUCTION:** "Three regular courses of lectures of five months each, attended through three several years," are required. Students are also required to attend clinics regularly throughout the term. At the beginning of each session examinations are held to determine the progress of the student during the year past, his advancement depending on the result of such examination. The preliminary term of 1890 opened on March 3, and closed May 10. The regular course of lectures commenced June 2, and closed October 31. Senior class compelled to attend preliminary course.

**STUDIES:** First year—*anatomy, physiology, histology, microscopy, materia medica, medical chemistry, pharmacy, dissections, dispensary and laboratory work.* Final examinations in pharmacy and laboratory work at end of first year. Second year—*anatomy, physiology, materia medica, medical chemistry, principles and practice of medicine, principles and practice of surgery, therapeutics, histology, obstetrics, pathology, dissection and surgical and medical clinics, hygiene, dispensary.* Final examination at end of second year in *physiology, materia medica, medical chemistry, histology and hygiene.* Third year—*principles and practice of medicine, principles and practice of surgery, therapeutics, medical jurisprudence, ophthalmology and otology, obstetrics and gynecology, with special clinics, anatomy, clinical medicine, surgery, diseases of children and mental diseases, pathology, special clinics.* Graduates of this college and those holding certificates of attendance upon lectures are credited for the full time of their medical studies by the Royal Colleges of Surgeons of England, Edinburg and Glasgow.

**REQUIREMENTS:** For admission: an examination in English composition, arithmetic, geography and physics; none required of candidates who are graduates of a literary or scientific college, or recognized normal or high school.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three full years' study; 4) three regular courses of lectures; 5) satisfactory written and oral examination; 6) practical anatomy during two sessions, and dissections of all parts of parts of the cadaver.

**FEES:** Matriculation, once only, \$5; demonstrator, \$10; first and second courses of lectures, \$130 each; third course, free; graduation, \$40.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	61	16	26.2
1882	59	15	25.4
1883	61	11	18+
1884	43	15	34.8
1885	53	13	24.5
1886	49	7	14.2
1887	62	16	25.8
1888	70	11	15.7
1889	97	15	14.7
1890	75	17	17.3

Percentage of graduates to matriculates for past ten years, 21.5.

## CALIFORNIA MEDICAL SOCIETY AND COLLEGE OF PHYSICIANS.

SAN FRANCISCO, Cal.

INCORPORATED October 21, 1876.—Extinct 1877.

## CALIFORNIA MEDICAL COLLEGE (*Eclectic*).

SAN FRANCISCO, Cal. D. MACLEAN, M. D., Dean, 6 Eddy street.

ORGANIZED in 1879, and located at Oakland. Removed to San Francisco after the close of the session of 1887. The first class was graduated in 1880.

The faculty consists of eleven professors and a demonstrator.

**COURSE OF INSTRUCTION:** One intermediate and one regular term annually. The regular term commences on the first Monday in June (annually), and continues six months. The intermediate term commences on the first Monday in March (annually), and continues twelve weeks. Three years' graded course required.

Lectures embrace principles and practice of medicine, obstetrics, surgery, anatomy, surgical anatomy, physiology, materia medica, therapeutics, chemistry, clinical and operative surgery, clinical medicine, pathology, gynecology, medical jurisprudence, clinical midwifery, diseases of children, clinical diseases of women, clinical diseases of children, mental diseases, hygiene, ophthalmology, otology, clinical diseases of the eye and ear, toxicology, physical diagnosis, laryngoscopy diseases of the heart and lungs, and nervous diseases. Clinics at hospital and dispensary.

**REQUIREMENTS:** For admission: 1) certificate of good moral character; 2) diploma from university, literary or scientific college, high school or first grade teacher's certificate, or a thorough examination in the branches of a good English education, including mathematics, English composition and elementary natural philosophy; 3) at least one year's study with a preceptor.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) "such education as shall give him proper stading with the public and profession;" 4) three regular courses of lectures, **and at least one years' study with a preceptor;** 5) practical anatomy, at least two sessions, and present tickets of having dissected every part of the cadaver; 6) "satisfactory examination upon the essential points in the general practice of medicine;" 7) thesis.

**FEES:** Matriculation, \$5; lectures, \$120; demonstrator, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	25	10	40
1882-83	32	11	34.4
1883-84	30	9	30
1884-85	26	5	19.2
1885-86	24	14	58.3
1886-87	28	7	25
1887	21	6	28.5
1888	24	10	41.6
1889	30	8	26.6
1890	41	6	14.6

Percentage of graduates to matriculates for past ten years, 30.6.

### HAHNEMANN HOSPITAL COLLEGE OF SAN FRANCISCO.

SAN FRANCISCO, Cal. W. A. DEWEY, M. D., Registrar, 824 Sutter street.

**ORGANIZED** in 1794 as the "Hahnemann Medical College." Name changed to "Hahnemann Hospital College" in 1888.

Faculty contains thirteen professors, one lecturer and one demonstrator of anatomy.

**COURSE OF INSTRUCTION:** Graded, extending over three years: session begins first Thursday in May, and continues six months.

Lectures embrace: First year—Descriptive and practical anatomy, chemistry physiology, materia medica, histology, microscopy, hygiene, toxicology. Second year—descriptive and surgical anatomy, materia medica and clinics, chemistry, microscopy and urinalysis, pathology, surgery, principles and practice, of medicine, obstetrics. Third year—materia medica and clinics, principles and practice of medicine and surgery, operative obstetrics, gynecology, ophthalmology, otology, and medical jurisprudence.

**REQUIREMENTS:** For admission: 1) certificate of good moral character. 2) diploma from a good literary and scientific college or high school, or a first grade teacher's certificate; 3) lacking this, a thorough examination in the branches of a good English education.

For graduation: 1) twenty-one years of age; 2) good moral and professional character; 3) study of medicine for the full period of three years; 4) three full courses of lectures; 5) certificate of having dissected three parts; 6) satisfactory examination in each department.

**For requirements of the American Institute of Homœopathy for admission and graduation in 1892, See Preliminary Remarks.**

**FEES:** Matriculation (once only) \$5; lectures (three courses) \$265; one full course \$125; demonstrator, \$10; graduation, \$40; single tickets, \$10 each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1884	23	7	30.4
1885	17	5	29.3
1886	24	10	41.6
1887	12	7	58.3
1888	21	9	42.8
1889	18	10	55.5
1890	15	4	26.6

Percentage of graduates to matriculates for past seven years, 40.

# THE COLLEGE OF MEDICINE OF THE UNIVERSITY OF SOUTHERN CALIFORNIA.

Los Angeles, Cal. J. P. WIDNEY, A. M., M. D., Dean, Widney Block, First street.

ORGANIZED November, 1883. The faculty consists of nineteen professors, two lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** Graded, extending over three years. Term commences the second Wednesday of October, and continues to the fourth Wednesday in May. Women admitted upon same terms as men. The term has been lengthened one and one-half months; attendance compulsory.

Lectures embrace principles and practice of medicine, clinical medicine, principles, and practice of surgery, clinical surgery, anatomy, surgical anatomy, histology and microscopy, materia medica and therapeutics, obstetrics, gynecology, physiology, chemistry and toxicology, pathology and diseases of the skin and genito-urinary organs, diseases of the mind and nervous system, diseases of children, hygiene, ophthalmology and otology, medical jurisprudence, operations in surgery; hospital, laboratory and dispensary work.

**REQUIREMENTS:** For admission: the student must pass a matriculating examination unless he is a graduate of some university, college, high school, academy or normal school, or holds a first-grade teacher's certificate for the public schools. The examination will cover English composition, and other ordinary English branches as taught in the public schools. An acquaintance with the rudiments of Latin will be required. If the applicant has never studied Latin, he will be allowed to make this up after commencing his medical studies.

For graduation: 1) twenty-one years of age and good moral character; 2) must have studied medicine three full years and attended three regular courses of medical lectures, the last of which must have been in this college; 3) must pass satisfactory examination, must have dissected the entire cadaver, done the necessary amount of laboratory and chemical work, and submit a satisfactory thesis.

**FEES:** Matriculation, \$5; lectures (three courses) \$260; demonstrator, \$10; graduation, \$40.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1885-86	10	—	—
1886-87	20	—	—
1887-88	21	9	42.8
1888-89	26	2	7.6
1889-90	33	6	18.1

Percentage of graduates to matriculates for the past five years, 15.09.

## CANADA.

**PRACTITIONERS** of medicine in Canada must be registered, and the requirements demanded vary in different provinces. The possession of the degree of Doctor of Medicine, granted by a recognized university, entitles its holder to registration in all the provinces except Ontario. The curriculum of studies required of a university, in order that its degrees may be registered, is set forth in the following sections of the Quebec Medical Act, and is applicable, with slight changes, to all the provinces:

§ 8. From and after the passage of this act, no person shall be admitted as a student of medicine, surgery or midwifery unless he shall have obtained a certificate of qualification from the said Provincial Medical Board. And no one shall be entitled to the license of the college, on presentation of a diploma, unless he shall have been previously admitted to the study of medicine, in accordance with the provisions of this act, or unless he shall have passed an equivalent preliminary examination before a college, school or board, authorized by law to require and cause such preliminary examinations to be passed in Her Britannic Majesty's possessions, elsewhere than in the Province of Quebec, and acceptable to the board created by this act. \* \* \* The subjects of the preliminary qualifications to be English and French, Latin, geography, history, arithmetic, algebra, geometry, belles-lettres, and any one of the following subjects: Greek, natural or moral philosophy; and the candidate to present a certificate of good moral character.

§ 15. The qualifications to be required from a candidate for obtaining a license authorizing him to practice medicine, surgery and midwifery, shall consist in his holding a certificate of study from a licensed physician, for the period intervening between the courses of lectures which he has followed; that he is not less than twenty-one years of age; that he has followed his studies during a period of not less than four years, commencing from the date of his admission to the study of medicine by this board, and that, during the said four years, he shall have attended, at some university, college or incorporated school of medicine within Her Majesty's Dominions, not less than two six months' courses of general or descriptive anatomy, of practical anatomy, of surgery, of practice of medicine, of midwifery, of chemistry, of materia medica and general therapeutics, of the institutes of medicine, of physiology and general pathology, of clinical medicine and of clinical surgery; one six-months' course or two three-months' courses of medical jurisprudence and of hygiene; one three-months' course of botany; one three-months' course, and a course of not less than twenty-five demonstrations, upon microscopic anatomy, physiology and pathology; also, that he shall have attended the general practice of a hospital in which are contained not less than fifty beds, under the charge of not less than two physicians or surgeons, for a



period of not less than one year and a half, or three periods of not less than six months each; and that he shall also have attended six cases of labor, and compounded medicines for six months. And to remove all doubts with regard to the number of lectures which the incorporated schools of medicine of the Province of Quebec are bound to give, it is enacted and declared that each six-months' course shall consist of one hundred and twenty lectures, except in the case of clinical medicine, clinical surgery and medical jurisprudence. Of the four years' study required by this act, three six-months' sessions at least shall be passed in attendance upon lectures at a university, college or incorporated school of medicine recognized by this board, the first whereof shall be so passed the session immediately succeeding the preliminary examination, and the last during the fourth year of study, and the candidate shall undergo an examination, on the final subjects of the curriculum, at the end of the session in his fourth year of study.

It is optional with the Quebec Provincial Board to accept or reject the degree of a university outside the province, and the test of an examination is sometimes imposed upon its holder.

Graduates of United States medical schools, in order to register in a province of Canada, unless holding an academical degree, must 1) pass the matriculation examination; 2) attend a Canadian school one or more full winter courses, so as to complete the curriculum of the province; and 3) pass the professional examination.

Manitoba is an exception, the regulation there being as follows: "American students in medicine [meaning graduates of medical colleges in the United States] obtain a license by passing a practical examination satisfactory to the board on the following subjects, viz: Anatomy, physiology, theory and practice of medicine, surgery, midwifery and diseases of women and children; chemistry; materia and therapeutics; medical jurisprudence and toxicology." For this examination, and subsequent registration, a fee of \$100 is charged.

## Ontario.

### ONTARIO MEDICAL ACT.

#### THE COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO.

TORONTO, Ontario. ROBERT A. PYNE, M. D., M. C. P. S. O., Registrar.

The Medical Profession in Ontario was first incorporated under this name by an Act of Parliament of Canada, passed in 1866. This act was subsequently repealed by the Legislature of Ontario in 1869. The present Act was passed in 1874, and amended in 1887.

The central examining board of the College of Physicians and Surgeons is composed of such elements as fairly represent every interest in the profession; and its examinations are conducted so as to inspire the fullest confidence on the part of the several colleges, and of the students attending these institutions.

A Council of the College of Physicians and Surgeons is created, empowered and directed to enact By-Laws for the regulation of all matters connected with medical education for the admission and enrollment of students of medicine; for determining from time to time the curriculum of the studies to be pursued by them and to appoint a Board of Examiners before whom all must pass a satisfactory examination before they can be enrolled as members of the College, and thus be legally qualified to to practice their profession in the Province of Ontario. The only mode in which medical men duly qualified to practice in other countries can become legally entitled to practice in Ontario, is by license from the Council.

Annual meeting is held on second Tuesday in June of each year, at Toronto. The Council is composed of twelve territorial representatives who are elected by members of the College and of one member from each of the Colleges and bodies in the Province now authorized or hereafter to be authorized by law to establish a Medical Faculty, and grant degrees in Medicine and Surgery, and serve for a period of five years. A most important provision is made that no teacher, professor or lecturer shall hold a seat in the Council except as a representative of the College or body to which he belongs. Homeopaths are represented on the Council by five members, but in matriculation and primary professional work, extending through the first two years, all candidates have to undergo the same examination.

A special examiner is appointed in case any candidate desires to be examined and registered as a Homeopathic practitioner.

An annual assessment of "not less than \$1, or more than \$2," can be levied on each registered practitioner.

The Council has the right to approve a tariff of fees for medical services, and the act declares who are entitled to registration as licensed practitioners.

Penalties are provided for neglecting to register or for falsification of record. Fees cannot be recovered nor appointments held in the public service by those not registered.

Following are the requirements of the Examining Board for 1890-91.

Matriculation—I. Everyone desirous of being registered as a Matriculated Medical Student in the Registrar of this College, except as hereinafter provided, on and after 1st July, 1888, must present to the Registrar the official certificate of having passed the Second Class, Non-Professional Examination, as prescribed for Form II, of the High School course of study, embracing the following subjects:

1. Reading; 2. Orthography and Orthoepy; 3. English Grammar; 4. Composition; 5. Literature; 6. English History; 7. Geography (modern); 8. Arithmetic; 9. Algebra; 10. Geometry; 11. Physics; 12. Chemistry; 13. Botany; 14. Latin; 15. Drawing; whereupon he shall be entitled to be so registered upon the payment of \$20, and giving proof of his identity.

II. Graduates in Arts, or Students having matriculated in Arts in any University in Her Majesty's Dominion, are not required to pass this examination.

**MEDICAL CURRICULUM**—1. Every student must spend a period of four years in actual professional studies except as hereinafter provided; and the prescribed period of studies shall include four Winter sessions of six months each, and one Summer session of ten weeks, attended *after* being registered as a Medical Student in the Register of the College of Physicians and Surgeons of Ontario. Graduates in Arts of any College or University recognized by the Council will only be required to pass three years, after graduating, in attendance upon medical lectures, before being admitted to their final examination. No tickets for lectures will henceforward be accepted by the Council unless it is endorsed thereon that the pupil had attended said lectures regularly.

III. Each six months' course shall consist of not less than one hundred lectures, and each "three months' course" of not less than fifty lectures.

IV. Every student must attend the undermentioned course of lectures in a University, College or School of Medicine, approved of by the Council, viz: Two courses of not less than six months each (in different years) upon anatomy, practical anatomy, physiology, (including histology) theoretical chemistry, materia medica and therapeutics, principles and practice of medicine, principles and practice of surgery, midwifery and diseases of women and children, clinical medicine, clinical surgery, two courses of not less than three months each (in different years) upon medical jurisprudence, one course of not less than three months each upon practical chemistry (including toxicology), botany, one course of not less than fifty demonstration lectures upon medical and surgical and topographical anatomy. One course of not less than twenty-five demonstrations upon physiological histology and pathological histology each. One course of not less than twenty lectures on sanitary science.

V. Every candidate will be required to prove that he has carefully dissected the whole adult human body.

Every student must have spent a period of six months in compounding medicines, must have attended the practice of a general hospital for 24 months, and had six cases of midwifery and attained the full age of 21 years, and pass satisfactorily the required examinations.

**FEEs OF THE COUNCIL:** Registration of matriculation, \$20; primary examination, \$30; final examination including registration, \$50.

## TORONTO SCHOOL OF MEDICINE.

*(Affiliated with the University of Toronto and the University of Victoria College.)*

**ORGANIZED** in 1843. Incorporated by act of parliament in 1851. Degrees were first conferred upon its students by affiliated Universities, in 1845, and have been so conferred each subsequent year to the time of its suspension in 1887.

## UNIVERSITY OF TORONTO MEDICAL FACULTY.

TORONTO, Ont. ADAM H. WRIGHT, B. A., M. D., Secretary, 20 Gerrard street, East.

**ORGANIZED** in 1843 as the Medical Faculty of King's College. Soon after its organization the name was changed to the Medical Faculty of the University of Toronto. The faculty was paid by the State. After an existence of ten years, the endowed chairs were abolished by an act of the legislature, and in 1853 the school became extinct. In 1887 the Government of Ontario granted the University authorities power to establish a Medical Faculty, without expense to the government. Provision was immediately made, and the school re-opened in 1887.

The faculty consists of eighteen professors, five lecturers, one instructor, four demonstrators and four assistant demonstrators.

**COURSE OF INSTRUCTION:** The regular course of instruction will consist of four sessions of six months each. Graduates in Arts may complete full course in three years if they choose. The session of 1890-91 opened October 1, 1890; summer session will commence May 4, 1891.

Lectures embrace surgery, principles of surgery and surgical pathology, clinical surgery, theory and practice of medicine, medical pathology, dermatology, clinical medicine, gynecology, obstetrics, materia medica, pharmacology, therapeutics, medical jurisprudence, toxicology, sanitary science, medical psychology, ophthalmic and aural surgery, laryngology, rhinology, pathological histology, descriptive and surgical anatomy, biology, physiology, chemistry, medical chemistry, physics and diseases of the nervous system.

**REQUIREMENTS:** For admission: "candidates presenting themselves for examination must produce satisfactory certificates of good conduct, and of being sixteen years of age." The following classes of applicants are exempt from the matriculation examination: 1) possessing a degree in arts, not being an honorary degree, from any Dominion or British University; or 2), having already matriculated in the faculty of arts or in the faculty of law in this University; or 3), matriculants in the College of Physicians and Surgeons of Ontario. Matriculation examinations will be held annually in June and September, and embrace Latin, and either Greek, French or German, mathematics, English composition, history, geography and chemistry.

For degree of M. B., 1) satisfactory examination on all required branches; 2) evidence of having compounded medicines for a period of three months; 3) proficiency in vaccination; 4) attendance on at least six clinics in a public lunatic asylum; 5) attendance six months out-practice of a hospital or dispensary, and eighteen months in wards of public hospitals; 6) dissection twice of the entire body; 7) attendance on twelve post-mortem examinations; 8) attendance on six cases of midwifery.

For graduation: "The requisites for admission to the degree of M. D. are: Having been admitted to the degree of M. B., being of one year's standing from admission to the degree of M. B., and having composed an approved thesis upon some medical subject."

**FEES:** Matriculation (once only) \$5; for annual examination (each) \$5; lectures, first year, \$73; second year, \$76; third and fourth years, each, \$86; hospital fee, \$8; graduation, \$20.

**STUDENTS:** Number of matriculates and of graduates, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1887-88	245	59	24.
1888-89	256	46	17.9
1889-90	263	42	15.9

Percentage of graduates to matriculates for past three years, 19.2.

### TRINITY MEDICAL COLLEGE.

*"Affiliated with the University of Trinity College, the University of Toronto, Queen's University, Victoria University, and the University of Manitoba."*

TORONTO, Ont. W. B. GEEKIE, M. D., C. M., Dean, 52 Maitland street.

ORGANIZED in 1850 as the Upper Canada School of Medicine, which in its first session became the Medical Faculty of Trinity College, and after an existence of four years ended by the resignations of the professors, who refused to submit to certain test enactments of a religious nature demanded by the corporation. In 1870 the Faculty of Medicine of Trinity College was reorganized, and it exists now as a separate corporation. Until 1888 it was known as the Trinity Medical School, when, by an act of the legislature, the name was changed to the above title. The school confers the degree of "Fellow by Examination of Trinity Medical School," which is "in every respect the equivalent of M. B., M. D., or M. D., C. M., at Trinity College." [GRIEKE.]

The faculty consists of eleven professors, six lecturers, four assistants and one instructor.

**COURSE OF INSTRUCTION:** The winter session of 1890-91, beginning October 1, 1889, continues six months; the summer session begins May 1, and ends June 30, 1891. Four years' attendance is required for graduation.

Lectures embrace the principles and practice of medicine and surgery, materia medica, therapeutics, anatomy, obstetrics, diseases of women and children, chemistry, sanitary science, medical jurisprudence, physiology, histology, pathology, ophthalmology, otology, laryngology, rhinology, practical pharmacy, medical psychology, zoology, botany, physics. Three examinations are held during the course, viz.: at the close of the first, second and fourth years.

**REQUIREMENTS:** Students are advised to pass the matriculation examinations of the Medical Council of Ontario or those of the affiliated universities before entering; but are allowed to attend lectures without any examination, though none such can obtain a degree. Students not matriculated elsewhere desiring to take the Fellowship Diploma are required to pass an examination on the following subjects: 1) writing and dictation; 2) English language, including grammar and composition; 3) arithmetic; 4) algebra, including simple equations; 5) Euclid; 6) Latin; and 7) either Greek, German, French or natural philosophy.

For graduation: degree of M. B.; a) a recognized matriculation examination; b) four entire years' pursuit of medical studies; c) attendance on at least two full courses of primary and two full courses of final lectures during four winter sessions; d) satisfactory examination in all required branches, and e) certificate of good moral character. For degree of M. D. twenty-one years of age; eighteen months' attendance on the practice of some general hospital; six months practice in a lying-in-hospital; attendance upon six cases of labor; four years of study; two successful University examinations.

**FEES** Registration, \$5; lecture course, each chair, \$12, excepting practical anatomy, practical chemistry, normal and pathological histology, each, \$8; medical jurisprudence, \$6; hygiene and botany, each, \$5; examinations, \$15; summer session, \$20; Toronto general hospital and lying-in-hospital, each per six months, \$8; degree M. D. \$24.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	168	35	20.7
1882-83	205	38	18.5
1883-84	222	62	27.9
1884-85	260	58	22.3
1885-86	292	70	24
1886-87	300	60	20
1887-88	300	85	28.3
1888-89	289	70	24.2
1889-90	280	70	25

Percentage of graduates to matriculates for past ten years, 23.6.

**REMARKS:** The number of graduates given above includes, "men licensed by the Council."

### MEDICAL DEPARTMENT OF VICTORIA COLLEGE.

(Also known as "Rolph's School.")

TORONTO, Ont.

ORGANIZED in 1853.—Extinct since 1869.

### ROYAL COLLEGE OF PHYSICIANS AND SURGEONS.

(Affiliated with Queen's University, Kingston, and University of Trinity College, Toronto.)

KINGSTON, Ont. FIFE FOWLER, M. D., L. R. C. S., Edin., President of the Faculty.

ORGANIZED as the Medical Faculty of Queen's University in 1854. First class graduated in 1855, and classes graduated in each subsequent year. Being separately incorporated, the college confers the diplomas of "Licentiate" and "Fellow." Its students obtain the degrees of M. D. and C. M. from the Queen's University, Kingston, and the University of Trinity College, Toronto, upon passing the required examination.

The faculty consists of twelve professors, two lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** The winter session of 1890-91 began on Monday, October 1, 1890, and will continue six months; the summer term begins on the second week of April. The course of study is graded, covering four years, and fulfills the requirements of the provincial board. See excerpt from Quebec Medical Act.

Lectures embrace the principles and practice of medicine and surgery, materia medica, therapeutics, anatomy, obstetrics, diseases of women and children, chemistry, botany, sanitary science, medical jurisprudence, physiology, histology, pathology, pharmacy, microscopy, clinical medicine and surgery; hospital attendance.

**REQUIREMENTS:** For admission: "Candidates for the degree of the university or the diploma of the college must have completed a period of four years' study, and passed the matriculation examination of Queen's college, which is as follows: English language, grammar and composition; arithmetic with vulgar and decimal fractions; algebra, including simple equations; geometry, first two books of Euclid; Latin grammar and translation (Cicero, Virgil, Æneid, Cæsar, Bellum Gallicum), natural philosophy, as in Stewart's Physics, or one book in Greek, French or German. Graduates and matriculates in arts from a recognized university, and those who have passed the matriculation examination of the Medical Council of Ontario, are not required to pass the above matriculation examination."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) thesis; 4) certificates of attendance on the full course of instruction, as above, for four years, except graduates in arts and those who have passed a full year's pupillage in the office of a medical practitioner, of whom only three years' study is required; 5) evidence of having compounded medicines for a period of six months; 6) evidence of having attended six cases of midwifery; 7) satisfactory examinations; 8) attendance on six cases post-mortem examination, proficiency in use of microscope. For the fellowship: 1) a degree in arts, or an equivalent examination; 2) evidence of having been engaged in the practice of the profession for five years.

**FEES:** Registration (payable once only), \$5; tuition, per session, nine chairs, \$12 each; three chairs, \$6 each, and one chair, \$4; two chairs, \$3 each; hospital, \$4. For graduation diploma of licentiate, \$20; degree of M. D. and C. M., \$30; fellowship of college, \$50.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	48	11	23—
1883-84	105	14	13.3
1884-85	140	14	10
1885-86	160	36	22.5
1886-87	160	31	19.3
1887-88	153	28	18.3
1888-89	150	34	22.6
1889-90	145	32	22.

Percentage of graduates to matriculates for past eight years, 18.8.

Names of matriculates not given in announcement.

### MEDICAL DEPARTMENT OF THE WESTERN UNIVERSITY.

LONDON, Ont. WM. WAUGH, M. D., C. M., Registrar, 447 Ridout street.

**ORGANIZED** in 1882. First class graduated in 1883. Faculty consists of seventeen professors and two demonstrators.

**COURSE OF INSTRUCTION:** One annual graduating session of six months' duration. The sessions of 1890-91 began October 1, 1890. The course is graded and extends over four years. Lectures embrace anatomy, physiology, materia medica, chemistry, botany, histology, toxicology, therapeutics, medical jurisprudence, sanitary science, pathology, theory and practice of medicine, theory and practice of surgery, midwifery and diseases of women and children, clinical medicine and clinical surgery, microscopy, nervous and mental diseases and zoology.

**REQUIREMENTS:** For admission: (a) certificate of graduation or matriculation in any recognized British University; (b) certificates of having passed the provincial examination in English language, including grammar and composition, writing and dictation (correct spelling and legible writing are imperative) arithmetic, algebra, including simple equation, geometry, Latin, and upon one of the following subjects: Greek, French, German or natural philosophy, including mechanics, hydrostatics and pneumatics. Graduates of matriculates in any recognized university in Her Majesty's Dominions are exempted from this examination.

For graduation, for degree M. D.: 1) certificate of having passed a recognized matriculation examination; 2) four years' study; 3) four sessions of six months' each; 4) one six months' course on medical jurisprudence; one three months' course on botany; twenty-five lectures on chemistry and toxicology; twenty-five practical demonstrations on histology and pathology; twenty lectures on sanitary science and botany; 5) attendance for at least twenty-four months on the practice of some recognized hospital; 6) six months' attendance on the practice of a lying-in-hospital, and charge of six cases of confinement; 7) compounded medicines for six months; 8) good moral character; 9) twenty-one years of age.

**FEES:** Matriculation, \$5; registration, \$2; six chairs, \$12 each; six chairs, \$6 each; four chairs, \$5; and three chairs, \$10 each; hospital \$6; graduation, M. D., \$25.

**STUDENTS** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	15	1	6.6
1883-84	19	—	—
1884-85	18	2	11.
1885-85	53	7	13.2
1886-87	77	4	5.2
1887-88	52	9	17.3
1888-89	64	7	10.9
1889-90	58	12	20.6

Percentage of graduates to matriculates for past eight years, 11.7.

# WOMAN'S MEDICAL COLLEGE.

(Affiliated with the University of Trinity College, Toronto, and with the University of Toronto.)

TORONTO, Ont. R. B. NEVITT, B. A., M. D., Dean, 176 Jarvis street.

ORGANIZED in 1883. The college does not confer degrees, but is intended for "the education of ladies in the science and practice of medicine, so as to fit them to undergo the examinations of the College of Physicians and Surgeons of Ontario, which are required for the provincial license, and for degrees in medicine in the several universities."

The faculty consists of nineteen lecturers, one clinical lecturer, two associate lecturers, one demonstrator and two assistant demonstrators.

COURSE OF INSTRUCTION: One annual lecture term of six months' duration, beginning on the first of October, 1890, and continuing until April 1, 1891. Summer session April 27 to July 3, 1891. The course is graded, and extends through four years, and must include one summer session.

Lectures embrace the principles and practice of medicine and surgery, obstetrics, diseases of women and children, materia medica, therapeutics, botany, anatomy, microscopy, sanitary science, medical jurisprudence, toxicology, chemistry, ophthalmology, otology and sanitary science, rhinology, laryngology, physical diagnosis, physiology, pharmacy, pathology, histology, clinical surgery and medicine.

REQUIREMENTS: For admission: certificate of having passed the matriculation examination of the provincial board. Graduates in arts and students having matriculated in arts in any recognized university in Her Majesty's Dominions are exempt.

For graduation: 1) four years' study; 2) four courses of lectures of six months duration of which one full course of lectures in the primary and one in the final branches must be taken at the Woman's College; a graduate in arts, three courses; 3) two courses of six months each upon anatomy, dissection, physiology, histology, chemistry, materia medica, therapeutics, principles and practice of medicine and surgery; midwifery, diseases of women and children, and clinical medicine and surgery; two three months' courses in medical jurisprudence, one course of three months upon practical chemistry, toxicology, botany, pathology and hygiene; 4) dissect the whole human body; 5) six months practice in compounding medicines; 6) twenty-four months' attendance on hospital; 7) six cases of midwifery; 8) twenty-one years of age; 9) satisfactory examinations; 10) one summer session of ten weeks.

FEES: Registration, \$5; lectures, \$360; in four annual instalments of \$90, each; examination, first year, \$5; second and third year, \$3 each; final, including diploma, \$5; examination for degree, \$20 to \$30.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1886-87	24	2	8.3
1887-88	26	3	11.5
1888-89	35	3	5.7
1889-90	40	4	10

Percentage of graduates to matriculates for past four years, 9.6.

# WOMEN'S MEDICAL COLLEGE, KINGSTON.

(Affiliated with Queen's University.)

KINGSTON, Ont. HON. M. SULLIVAN, M. D., F. R. C. P. S. K., President of the Faculty.

ORGANIZED in 1883.

The faculty consists of nine professors, two lecturers, and one demonstrator in addition to which two professors of Queen's College give instruction in chemistry and botany.

COURSE OF INSTRUCTION: The complete course extends over four winter sessions of six months each and one summer session of three months. Students are recommended to take the summer session at the end of their second winter session. The winter session of 1890-91 began October 1, 1890. The summer session opens on the first of May in each year.

Lectures embrace obstetrics and diseases of women and children; principles and practice of surgery; materia medica and therapeutics, medical jurisprudence and sanitary science; theory and practice of medicine; physiology and histology, anatomy, descriptive and surgical; chemistry, botany, practical anatomy, clinical surgery, clinical medicine, pathology, ophthalmic and aural surgery, laryngology and rhinology, clinics at hospitals and college.

**REQUIREMENTS:** For admission. Before entering the student must decide where she intends to practice medicine. If in Ontario, she should, before entering college, either pass the teacher's second class certificate examination, with Latin included, or she should matriculate in arts in some university in Her Majesty's dominion. If outside of Ontario, she must, not later than the beginning of her second session pass the matriculation examination of Queen's University, which includes English language, grammar and composition, arithmetic, algebra, geometry, Latin grammar, natural philosophy. Graduates and matriculates in arts from a recognized University, and those who have passed the Matriculation Examination of the Medical Council of Ontario, are not required to pass the above matriculation examination.

For graduation: The degree of M. D. is conferred upon students who spend four winter and one summer session and pass the required examinations (except that graduates in arts will be required to attend lectures for three years only); must have compounded medicines for six months, and have attended at least six cases of midwifery, and six post-mortem examinations; practical knowledge of the microscope; twenty-one years of age; good moral character; thesis.

**FEES:** Registration, once only, \$5; nine chairs, \$12 each; medical and surgical anatomy, \$10; practical anatomy, histology, \$8; four chairs, \$6 each; sanitary science, \$4. Hospital fee for three sessions, \$10; graduation, \$30. Except in practical anatomy, chemistry, histology, and botany, the third and subsequent courses in any branch, free.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	11	3	27.2
1884-85	14	2	14.2
1885-86	15	2	13.3
1886-87	18	3	16.6
1887-88	23	5	21.7
1888-89	23	1	4.3
1889-90	22	6	27.2

Percentage of graduates to matriculates for past seven years, 17.4.

## Quebec.

### McGILL UNIVERSITY, FACULTY OF MEDICINE.

MONTREAL, Que. ROBERT CRAIK, M. D., Dean.

ORGANIZED in 1824 as the Montreal Medical Institution; became the Medical Department of McGill University in 1829. No class graduated during the Canadian Rebellion, 1837-40.

The faculty consists of thirteen professors, one demonstrator, three assistant demonstrators and five instructors.

**COURSE OF INSTRUCTION:** The complete course of study extends over four winter sessions of six months, and one summer session of three months in the third academic year. The collegiate year of 1890-91 began October 1, 1890, and the summer session will begin April 14, 1891, and continues twelve weeks.

The examinations at the end of each session are arranged as follows: First year, pass examination in histology and botany; sessional examination in anatomy, chemistry and physiology. Second year, pass examination in anatomy, chemistry, practical chemistry and physiology; sessional examination in pharmacology and therapeutics. Third year, pass examination in pharmacology and therapeutics, medical jurisprudence, hygiene and pathology. Fourth year, pass examination in medicine, surgery, obstetrics, clinical medicine and clinical surgery.

**REQUIREMENTS:** For admission: See section eight of the Quebec Medical Act.

For graduation: See section fifteen of the Quebec Medical Act—except that McGill requires attendance on lectures for four winter sessions of six months and one summer session of three months, and examinations in clinical medicine and surgery are conducted at the bedside.

**FEES:** Lectures, \$100 for each of four years; summer session, \$25; hospital, \$29; university matriculation, \$5; graduation, \$30; separate lecture course, \$2 to \$15.

STUDENTS: Number of matriculates and of graduates of each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	168	38	22.7
1881-82	154	27	17.5
1882-83	188	30	15.9
1883-84	212	34	16+
1884-85	234	36	15.4
1885-86	237	46	19.4
1886-87	231	45	19.4
1887-88	239	54	22.5
1888-89	235	38	16.3
1889-90	260	56	21.5

Percentage of graduates matriculates for past ten years, 18.7.

### ECOLE DE MEDECINE ET DE CHIRURGIE.

(Affiliated with the University of Victoria.)

MONTREAL, Que. L. D. MIGNAULT, A. B., M. D., C. M., Registrar, 155 rue Bleury.

ORGANIZED in 1843, and incorporated in 1845. Degrees were first conferred on its students in 1845. Degrees have been conferred each subsequent year.

The faculty contains thirteen professors, two lecturers and three demonstrators.

COURSE OF INSTRUCTION: One annual session of six months duration, attendance upon which is compulsory. Students are not received after the first month. The complete course extends over four years, but the law allows the student to spend the second or third year with a practitioner.

Lectures embrace chemistry, pharmacy, toxicology, materia medica, therapeutics, midwifery, diseases of women and children, physiology, pathology, principles and practice of medicine and surgery, medical jurisprudence, botany, hygiene, histology and ophthalmology, otology, laryngology, anatomy, physics, dermatology, clinical surgery and medicine.

REQUIREMENTS: For admission: See section eight of the Québec Medical Act.

For graduation: See section fifteen of the Québec Medical Act.

FEES: Matriculation, not allowed after November first, \$2; two courses of lectures, fee \$60 for each course; general hospitality and maternity hospital, each \$4 per session; graduation, \$30.

STUDENTS: Number of matriculates and graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent
1884-85	155	26	16.7
1885-86	159	24	15+
1886-87	183	36	19.6
1887-88	177	37	20.9
1888-89	202	36	17.8
1889-90	213	53	24.8

Percentage of graduates to matriculates for past six years, 19.4.

### ST. LAWRENCE SCHOOL OF MEDICINE.

QUEBEC, Que,

ORGANIZED in 1851—Extinct, 1852.

### LAVAL UNIVERSITY, MEDICAL DEPARTMENTS.

QUEBEC, Que. ARTHUR VALLEE, M. D., Secretary, 22 rue Ste. Anne.

MONTREAL, Que. HUGHES E. DESROSIERES, M. D., Secretary, 132 rue Ste. Laurent.

ORGANIZED in 1852. The department in Quebec is the successor of the Quebec School of Medicine, which was organized in 1843, and existed four years. The department in Montreal is known as the "Secoursale," and was organized in 1878. The first class was graduated in 1855, and a class has been graduated each year since.

The faculty consists of twenty-six chairs, thirteen in each school.



**COURSE OF INSTRUCTION:** One annual session of about thirty-five weeks' duration; attendance is compulsory; the course is graded, and extends over four years.

Lectures are divided into two sections, primary and final. Primary—descriptive anatomy 240 lectures, practical anatomy 180 lectures, of two hours each; microscopical anatomy and histology 120 lectures, physiology 150 lectures, general pathology 80 lectures, hygiene 60 lectures, chemistry 240 lectures, botany 60 lectures; examination at the end of this course. Final section includes materia medica and general therapeutics 240 lectures, surgical pathology and theoretical surgery 240 lectures, medical pathology and special therapeutics 240 lectures, gynecology and diseases of children 240 lectures, medical jurisprudence 60 lectures, toxicology 60 lectures, diseases of the eye and ear 60 lectures, practical operative surgery 40 lectures, clinical surgery 280 lectures, clinical medicine 270 lectures, clinical studies of the diseases of the eye and ear 60 lectures, clinical midwifery not less than six cases, clinical study of diseases of women and children; examination at the end of this course.

**REQUIREMENTS:** For admission: See section eight of the Quebec Medical Act.

For graduation: See section fifteen of the Quebec Medical Act.

**FEES:** \$15 to \$24 per term, according to years of study; dissection, \$5 per term; diploma, \$20.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	97	13	13.5
1881-82	104	12	11.5
1882-83	117	26	22+
1883-84	109	25	22.9
1884-85	85	22	25.8
1885-86	97	36	37.1
1886-87	136	27	19.8
1887-88	132	34	25.7
1888-89	149	35	23.4
1889-90	169	72	42.6

Percentage of graduates to matriculates for the past ten years, 25.2.

#### UNIVERSITY OF BISHOP'S COLLEGE, FACULTY OF MEDICINE.

MONTREAL, Que. F. W. CAMPBELL, M. A., M. D., Dean, 10 Phillips Place, Beaver Hall.

**ORGANIZED IN 1870.** The first class was graduated in 1871, and a class has been graduated each year since.

The faculty consists of eleven professors, four lecturers and a demonstrator of anatomy.

**COURSE OF INSTRUCTION:** The twentieth annual session commenced October 1, 1890, and will be continued to the end of March, 1891. The course is graded and extends over four years, as follows: First year, anatomy, physiology, chemistry, materia medica, histology, botany, hygiene, dissections and clinics. Second year, same as first year except botany, hygiene and histology omitted, and obstetrics and pathology added, hospital practice and clinics. Third year, medicine, surgery, pathology, obstetrics, gynecology, diseases of children, medical jurisprudence, hospital practice and clinics. Fourth year, same as third, except pathology and medical jurisprudence omitted, and ophthalmology added.

Women admitted upon the same terms as men, separate dissecting, reading and cloak rooms being provided, also duplicate lectures on certain subjects.

For graduation: See section fifteen Quebec Medical Act.

**FEES:** Registration each session, \$4; seven chairs, \$12 each; medical jurisprudence, \$10; six chairs, \$6; practical anatomy, \$10; practical chemistry, \$12; practical histology, \$16; degrees (O. M., M. D.) \$20; registration of degree, \$5; hospitals, six months, \$8 each; clinical medicine and surgery, \$12 each, each course.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	31	5	16+
1881-82	55	6	10.9
1882-83	34	3	8.8
1883-84	39	10	25.8
1884-85	23	4	17.3
1885-86	23	4	17.3
1886-87	31	5	16.1
1887-88	28	5	18
1888-89	39	5	12.8
1889-90	35	7	20

Percentage of graduates to matriculates for past ten years, 15.9.

**Nova Scotia.****HALIFAX MEDICAL COLLEGE.***(Affiliated with Dalhousie University.)*

HALIFAX, N. S. A. W. H. LINDSAY, M. D., Registrar, 241 Pleasant street.

ORGANIZED in 1867 as the Halifax School of Medicine, united the same year with Dalhousie University as its Medical Faculty; separately incorporated under its present title in 1875. In 1876 it was affiliated with the University of Halifax, but this body becoming inoperative it affiliated with Dalhousie University in 1885. (See Medical Department, Dalhousie University.)

First class graduated in 1872; classes graduated each subsequent year (except 1873) to 1885. No courses of instruction were given during the sessions of 1885-86 and 1886-87. During the session of 1887-88 instruction was given in the primary branches only, and such was the case for the session of 1888-89, after which satisfactory arrangements were completed for the resumption of the final subjects of the curriculum. Being affiliated with Dalhousie University the medical college refrains from conducting degree examinations or conferring degrees, both being left to the University.

Faculty consists of eleven professors, three lecturers, and one demonstrator.

COURSE OF INSTRUCTION: One annual course of six months' duration. That of 1890-91 began Monday, November 3, 1890, and will end Tuesday, April 21, 1891; attendance ascertained regularly and certified at end of session; four years' graded course commenced.

Lectures embrace principles and practice of medicine, clinical medicine, obstetrics, gynecology, principles and practice of surgery, clinical surgery, physiology, anatomy, dermatology, botany, diseases of children, practical chemistry, materia medica, therapeutics, microscopy, pharmacy, medical jurisprudence, toxicology, nervous diseases and insanity, public hygiene, ophthalmology, otology, histology and laryngology.

REQUIREMENTS: For admission as an undergraduate; a) certificate of having passed the matriculation examination of the Nova Scotia Medical Board. Compulsory: English language, including grammar, composition and writing from dictation; arithmetic, including vulgar and decimal fractions and the extraction of the square root; algebra to the end of simple equations; geometry,—Euclid, Book I, with easy questions on the subject matter of the same; Latin,—translation and grammar. Elementary mechanics of solids and fluids; And one of the following optional subjects; History of England, with questions in modern geography; French translation and grammar; German translation and grammar; Greek translation and grammar; History of Nova Scotia; History of the Dominion of Canada. b) certificate of having passed either of the medical matriculation examinations of Dalhousie University. Exemptions: a degree in arts or science from any chartered university or college or grade A. teacher's license of Nova Scotia exempts from further preliminary examination. The matriculation, sessional and degree examinations of any regularly chartered university or college, and the preliminary examination of any licensing medical board authorized by law in Her Majesty's Dominions, are recognized *pro tanto*. Persons are also admitted as general students without any preliminary examination, but such attendance does not qualify for graduation.

For graduation: Students of the Halifax Medical College receive the degrees M. D., C. M., from Dalhousie University. For requirements, (see Medical Department Dalhousie University.)

FEES: Registration, annual \$2; for perpetual \$50; matriculation examination (Nova Scotia Medical Board), \$10; lectures on surgery, medicine, obstetrics, \$15 each; anatomy materia medica, physiology, chemistry and practical anatomy, including material, \$12 each; medical jurisprudence, \$8; practical chemistry, botany, clinical medicine, clinical surgery, ophthalmology, etc., \$6 each; histology, \$4; graduation fee, \$30.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1878-79	36	2	5.5
1879-80	37	2	5.4
1880-81	35	2	5.7
1881-82	37	1	2.7
1882-83	41	3	7+
1883-84	34	5	14.7
1884-85	32	1	3.1
1887-88	21	0	....
1888-89	19	0	....
1889-90	31	1	3.2

Percentage of graduates to matriculates for ten years reported, 5.2.

## DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE,

HALIFAX, N. S. GEO. LAWSON, Ph., D., LL. D., Secretary of the Senatus of the University.

A. W. H. LINDSAY, M. D., Secretary of the Faculty of Medicine.

ORGANIZED in 1867 with full teaching staff and maintained until 1876; incorporated as the Halifax Medical College in 1876.

REORGANIZED under its present title in 1885, mainly as an examining body. Teaching is provided in the University in chemistry and botany. In professional subjects students obtain instruction at the Halifax Medical College, which is affiliated with the University. The academic year consists of one session. That of 1890-91 commenced October 23, 1890, and will end April 23, 1891.

**MATRICULATION EXAMINATION.**—I. Candidates for medical degrees must give evidence of having obtained a satisfactory general education before entering upon the course of study qualifying for the degrees, by passing either one or other of the matriculation examinations of this faculty or some other examination recognized by the senate as sufficient.

II. The following are the subjects of the Lower Matriculation Examination: 1) English language, including grammar and composition; 2) Latin, including grammar, translation from specified authors and translation of easy passages not taken from such authors; 3) elements of mathematics, comprising *a*) arithmetic—including vulgar and decimal fractions; *b*) algebra—including simple equations; *c*) geometry—including the first book of Euclid or the subjects thereof; 4) elementary mechanics of solids and fluids, comprising the elements of statics, dynamics and hydrostatics,—as treated in *Blaikie's Elements of Dynamics*† (Thin, Edinburgh); 5) two of the following subjects: *a*) Greek including translation\* from the original and grammar; *b*) French including translation\* from the original and grammar; *c*) German including translation\* from the original and grammar; *d*) logic, as in *Jevon's Elementary Lessons in Logic*† (Macmillan & Co.)

III. The following are the subjects of the higher matriculation examination: 1) English, including *a*) writing a passage of English from dictation; *b*) English composition, with the correction of sentences of bad English; *c*) questions in English grammar with analysis of sentences and derivation and definition of some common English words; *d*) questions in geography and history, especially in the history of the British Islands and of English literature; 2) Latin, including grammar and translation of an easy passage from a Latin prose author and retranslation into Latin of a single passage of English translation from a Latin author, the more difficult Latin words being given; 3) arithmetic, the common rules including vulgar and decimal fractions; 4) elements of mathematics, comprising *a*) geometry, *Euclid's* Books I, II and III; *b*) algebra, including simple equations; 5) elements of dynamics (mechanics), comprising elementary kinematics, statics, kinetics and hydrostatics, as treated in *Blaikie's Elements of Dynamics* (Thin, Edinburgh); 6 and 7) any two of the following subjects: *a*) Greek; the subjects of the lower examination together with the translation of easy English sentences into Greek prose; *b*) French, the subjects of the lower examination together with translation of easy English sentences into French; *c*) German; the subjects of the lower examination together with translation of easy English sentences into German; *d*) natural philosophy; as in *Balfour Stewart's Elementary Physics*† (Macmillan & Co.); *e*) logic; *Jevon's Elementary Lessons in Logic*† (Macmillan & Co.)

IV. Examinations are held annually, during the month of October, in the College hall. They are conducted by the instructors of the arts faculty. Persons who wish to appear as candidates are required to give notice to the secretary of the faculty at least fourteen days before the date of examination (stating in such notice whether they are candidates for the lower or higher examination, and specifying the elective subjects in which they wish to be examined), to enter their names in the register of candidates, and to pay a fee of ten dollars.

V. The lower examination satisfies the requirements of the General Medical Council of Great Britain as to the preliminary examination which must be passed by persons wishing to register as medical students. The higher examination satisfies the requirements of the University of Edinburgh in the same respect. Certificates will be issued to candidates showing the subjects in which they passed and the extent to which their knowledge of these subjects was tested.

VI. A certificate of the possession of a university degree in arts, or of having passed the matriculation examination of the Provincial Medical Board of Nova Scotia, shall be considered by this university sufficient evidence of satisfactory general education.

**DEGREE EXAMINATIONS.**—Candidates for the degree of M. D., and C. M., shall be required to pass two examinations—the primary and the final M. D., C. M., examinations, and to have satisfied, at the dates of the examinations, certain conditions as to the attendance on classes, etc.

\*The following books are prescribed for October, 1891: *Cæsar, Gallic War, Books IV and V*, or *Virgil, Æneid, Book II*; in Greek, *Xenophon's Anabasis, Book V or VI or VII*; in French, *Voltaire's Charles XII.*, Books I and II, or *Scribner's "Bert and et Raton"*; in German *Adler's Reader, zweiter Abschnitt, Nos. 1-4, 14-17 (inclusive)*, or *Schiller's "Neffe als Onkel."*

†These books are mentioned to show the extent of knowledge expected. Other books may of course be used by candidates.

**FEES:** The following fees, payable by candidates for the degree of M. D., C. M., in all cases payable in advance: Registration, \$2; matriculation examination fee, \$10; chemistry class fee, \$12; chemistry laboratory fee (three months' course), \$6; botany class fee, \$6; graduation fee, \$25.

**STUDENTS:** Number of matriculates for 1885-86, 4.  
 Number of matriculates for 1886-87, 0.  
 Number of matriculates for 1887-88, 14.  
 Number of matriculates for 1888-89, 17.  
 Number of matriculates for 1889-90, 25.

## Manitoba.

### MANITOBA MEDICAL COLLEGE.

(*Affiliated with the University of Manitoba.*)

WINNIPEG, Ma. J. WILFORD GOOD, M. B., Dean of the Faculty, 456 Main street.

**ORGANIZED** in 1833. The faculty consists of ten professors, one demonstrator and three lecturers.

**COURSE OF INSTRUCTION:** One yearly session; that of 1890-91 began October 1, 1890, and will continue for six months.

Lectures embrace principles and practice of medicine, principles and practice of surgery, obstetrics, diseases of women and children, anatomy descriptive, surgical and practical, physiology, including histology, chemistry and chemical physics, materia medica and therapeutics, sanitary science, medical jurisprudence and toxicology, clinical surgery, clinical medicine, ophthalmology and otology, botany and pharmacy.

A fellowship degree is granted.

**REQUIREMENTS:** For admission—*Compulsory Subjects*—1) Latin, a prose author; 2) Latin, a verse author; 3) history, assigned subjects in history; 4) arithmetic (Hamblin Smith); 5) Algebra, to the end of simple equations; 6) Euclid definitions, books I and II, with simple deductions; 7) natural science—Heat, light and electricity, (Balfour Stewart). *Optional Subjects*—A student is also required to pass a satisfactory examination in two of the following: 8) a selected English poem; 9) a selected French poem; 10) Greek, one prose author; 11) German, one prose author; 12) mechanics. There shall be twelve papers set in this examination, corresponding to the number given above, for each of which three hours shall be assigned. In place of the above entrance examination the University has agreed to accept the matriculation examination of the Colleges of Physicians and Surgeons of the Provinces of Quebec and Ontario, the second class teacher's certificate of this Province, and also the Ontario High School intermediate examinations, except that the Latin of the entrance examination of this university must be taken by those who have not taken these subjects in the said High School examinations. A bachelor of arts of any university in Her Majesty's dominions is admitted to medicine without further examination, and may complete his medical course in three winter sessions of six months each.

For graduation: 1) twenty-one years of age; 2) two full courses of lectures; 3) eighteen months' attendance at some incorporated general hospital; 4) six months' practice in a lying-in-hospital or its equivalent, with a certificate of attendance upon at least six cases of labor; 5) three months' practice compounding medicines in a drug store or laboratory of hospital; 6) satisfactory examinations, primary and final; 7) good moral character.

**FEES:** Registration, \$5; seven chairs, each \$16; practical chemistry, \$12; six chairs, each \$6; pharmacy, \$5; hospitals, \$5 to \$10 each, per session; practical anatomy, \$8; pathology, \$10; graduation, M. D., or C. M., each \$10; license, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduatos.	Percent.
1883-84	15	—	—
1884-85	22	—	—
1885-86	28	6	21.4
1886-87	26	4	15.3
1887-88	27	8	29.6
1888-89	30	6	20
1889-90	48	6	12.5

Percentage of graduates to matriculates for the past five years, 18.8.

**COLORADO.****STATE BOARD OF MEDICAL EXAMINERS OF COLORADO.**

T. A. HUGHES, M. D., Secretary and Treasurer,, Denver, 730 16th street.

The Colorado State Board of Medical Examiners, authorized by legislative enactment, approved March 14, 1881, has a membership of nine practicing physicians, appointed by the Governor of the State, who hold their positions for a term of six years.

It is required of every person practicing medicine, in any of its branches, that he shall present his diploma to the Board of Medical Examiners for verification, or furnish other conclusive evidence of his being a graduate of a medical school in good standing. If not a graduate, the applicant is required to present himself for examination by the members of the Board, who may question him in whole, or in part, in writing, on the subjects of anatomy, physiology, surgery, obstetrics, chemistry, pathology and practice of medicine.

All persons who have made the practice of medicine and surgery their profession or business continuously for the period of ten years, and can furnish satisfactory evidence thereof to the Board of Medical Examiners, shall receive a license to continue practice.

The meetings of the Board are held quarterly, at the city of Denver, the first Tuesdays in January, April, July and October.

During the year 1890, 154 certificates were issued up to December 4. Fee for certificate, \$5; for examination, \$10.

At a meeting of the Colorado State Board of Medical Examiners, held at Denver, on July 1, 1890, the following resolutions were adopted:

**WHEREAS**, The Medical Practice Act of the State of Colorado provides that among the duties of the State Board of Medical Examiners, they shall "adopt (Sec. 3) such rules as are necessary for their guidance in the performance of the duties assigned them." Under this part of the statute it seems necessary to adopt a rule whereby an exact standard for the certification of diplomas shall be definitely found by this Board; also that a minimum standard of studies be required of applicants who shall present diplomas to this Board; therefore, be it

**Resolved**, That after July 1, 1893, this Board shall require of all applicants for license, who shall present their diplomas for certification, three years of professional study, as conditions of graduation. That the minimum requirements shall be as follows:

By the Colorado State Board of Medical Examiners, that after July 1, 1893, all applicants for license shall present evidence of having taken **three courses of lectures** of not less than twenty weeks each, in a legally chartered and reputable medical college recognized as such by the Colorado State Board of Medical Examiners. No two of these courses shall be taken within the same year.

**Resolved**, That after July 1, 1893, only such schools shall be recognized as meeting the requirements of this Board as require a preliminary examination for admission, or a diploma of graduation from some good literary or scientific school, high school or normal school, and as require at least twenty weeks of instruction in each twelve months for three separate years, and which give instruction in the following subjects, namely: Anatomy, chemistry, materia medica and therapeutics, obstetrics and gynecology, surgery, theory and practice of medicine, medical jurisprudence, physiology, pathology, hygiene.

At the October, 1890, meeting of the Board the following resolution was adopted:

**Resolved**, That the examinations hereafter be both written and oral, that an average of 70 percent. be considered as necessary for the granting of a license, and that failure to secure a percentage of more than 50 in any one branch shall be deemed sufficient cause for rejection by the Board.

**UNIVERSITY OF DENVER, MEDICAL DEPARTMENT.**

DENVER, Col. SAMUEL A. FISK, M. D., Secretary, Barth Block.

ORGANIZED in 1881. First class graduated in 1882.

The faculty consists of seventeen professors, one adjunct professor, six lecturers, two clinical instructors and one demonstrator.

**COURSE OF INSTRUCTION:** Instruction is given by lectures, recitations, clinical teaching and practical exercises. The tenth annual session, that of 1890-91, commenced September 17, 1890, and will close April 16, 1891.

**Lectures embrace:** For the Junior, or first year, anatomy, physiology, histology, materia medica and chemistry. For the middle or second year, anatomy, physiology, materia medica and therapeutics, chemistry, principles and practice of medicine and clinical medicine, principles and practice of surgery and clinical surgery, obstetrics, gynecology. For the Senior or third year, principles and practice of medicine and clinical medicine, principles and practice of surgery and clinical surgery, obstetrics, diseases of children, gynecology, ophthalmology and otology, laryngology, diseases of the chest, climatology, physical diagnosis, mental and nervous diseases, medical jurisprudence and public hygiene and diseases of the genito-urinary organs.

**REQUIREMENTS:** For admission: "An entrance examination will be required of all applicants for admission to the school who are not able to present a diploma from a high school or its equivalent. The subjects upon which such an applicant will be examined are English, arithmetic, geography and elementary physics."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) three full courses of lectures; 5) satisfactory examination, oral and written.

**FEES:** Matriculation, \$5; lectures, \$75; demonstrator, \$5; dissecting material, at cost; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	12	5	33+
1882-83	21	5	23.8
1883-84	22	5	22.7
1884-85	18	4	22.2
1885-86	26	10	38.4
1886-87	22	2	9+
1887-88	35	7	20
1888-89	29	8	27.5
1889-90	30	4	13.3

Percentage of matriculates to graduates for past nine years, 23.2.

#### MEDICAL DEPARTMENT, UNIVERSITY OF COLORADO.

BOULDER, Col. JAMES H. KIMBALL, M. D., Secretary, Denver, Col.

ORGANIZED in 1883.

The faculty consists of eight professors, three lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** Graded, and extends over a term of three years, with a session of nine months in each year. Session of 1890-91 began September 10, 1890, and will end May 27, 1891. Women admitted on the same terms as men.

Studies embrace: First year, anatomy and dissection, chemistry, physiology, histology, materia medica, therapeutics and botany. Second year, first year's studies (except botany) and pathology, physical diagnosis, practice of medicine, surgery and obstetrics. Third year, practice of medicine, surgery, obstetrics, diseases of women, pathology, diseases of children, ophthalmology, otology, laryngology, therapeutics, clinical medicine and surgery, diseases of the mind and nervous system, clinical gynecology, hygiene and public health and medical jurisprudence; oral examinations precede each lecture and clinic.

**REQUIREMENTS:** For admission: "All students entering the college will be required to pass a satisfactory examination in the branches of a good English education. Students who present a diploma or certificate of graduation from a literary or scientific college or a high school, shall be exempt from this preliminary examination."

For graduation: 1) twenty-one years of age; 2) a good moral character; 3) oral and written examinations satisfactory to the faculty; 4) not less than three full years of study, including time spent with preceptor and attendance upon clinics at hospital; 5) not less than three full courses of lectures; 6) dissection entire body; 7) thesis.

**FEES:** Matriculation, \$5; demonstrator, \$5; graduation and diploma, \$20; tuition free.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	8	—	—
1884-85	19	2	10.5
1885-86	5	2	40
1886-87	7	1	14.3
1887-88	15	1	6.6
1888-89	18	1	5.5
1889-90	25	4	16.

Percentage of graduates to matriculates for past six years, 12.3

## GROSS MEDICAL COLLEGE.

*(Medical Department of the Rocky Mountain University.)*

DENVER, Col. CLAYTON PARKHILL, M. D., Secretary, 1715 California avenue.

**ORGANIZED** in 1887. The faculty consists of fourteen professors, one demonstrator, one assistant demonstrator, two lecturers, and one director of clinics.

**COURSE OF INSTRUCTION:** The collegiate year for 1890-91 began September 24, 1890, and will close in April, 1891, a continuous term of seven months. Instruction will consist of didactic and clinical lectures, given in the college building and at the various dispensaries and hospitals with which the members of the faculty are connected. **Three years' graded course required.** Women admitted upon the same terms as men.

Lectures embrace principles and practice of medicine, surgery, anatomy, obstetrics, gynecology, materia medica and therapeutics, chemistry, physiology, ophthalmology and otology, diseases of the nervous system, diseases of children, laryngology, rhinoscopy, dermatology, climatology and medical jurisprudence, pediatrics, pathology.

**REQUIREMENTS:** For admission: "Candidates for matriculation who can not present a diploma from some college, normal school or high school, will be required to give satisfactory evidence of a fair English education."

For graduation: "Each candidate must be at least twenty-one years of age, and of good moral character. Evidence must be given of his having studied medicine three years, and of having attended **three full courses of lectures**, the last of which shall have been in this college; dissection of the entire body: one course in the chemical laboratory; one term in clinical and hospital work. Examinations will be both written and oral, and satisfactory proficiency will be demanded."

**FEES:** Matriculation, \$5; lectures, \$75; demonstrator, \$5; graduation, \$10; dissecting material at cost. Single ticket \$25 each subject.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session,	Matriculates.	Graduates.	Percent.
1887-88	20	7	35.
1888-89	24	10	41.6
1889-90	37*	10	27.4

Percentage of graduates to matriculates for past three years, 33.3.

## CONNECTICUT.

YALE UNIVERSITY, DEPARTMENT OF MEDICINE.

*(Yale Medical School.)*

NEW HAVEN, Conn. HERBERT E. SMITH, M. D., Dean of the Faculty, 150 York street.

Charter granted, 1810. Organized in 1812, as the Medical Institution of Yale College. Instruction began 1813. In 1879 a new charter changed the title to the Medical Department of Yale College. In 1884 the college authorities assumed the entire control of the school, the Connecticut Medical Society retiring from the board of examiners.

The faculty consists of nine professors, and one assistant professor, one demonstrator of physiology, six lecturers and three assistants to chairs.

**COURSE OF INSTRUCTION:** Graded, extending through three years and consisting of three lecture terms covering thirty-four weeks, exclusive of vacation and recess, annually; the first commences the first Thursday in October and continues eleven weeks; the second begins three weeks after the close of the first, and continues twelve weeks; the third begins in April, and continues eleven weeks. Instruction is given to graduates and special students. Written examinations are held at the close of each year on the studies of the year. Didactic lectures are still employed as best in some branches, but recitations from assigned readings, with explanatory lectures, laboratory work, and personal instruction in the clinics, constitute the main portion of the curriculum.

Lectures embrace, in the first year, general chemistry, qualitative analysis; physiological chemistry, anatomy, dissections, autopsies; normal histology; physiology. The second year, anatomy, dissections, physiology, pathology, materia medica and therapeutics, theory and practice of medicine, clinical medicine, obstetrics, surgery, clinical surgery, diseases of women and children. Third year, pathology, theory and practice of medicine, physical diagnosis, clinical medicine, surgery, clinical surgery, obstetrics, diseases of women and children, ophthalmology, otology, rhinology, medical jurisprudence, insanity, nervous diseases, diseases of the skin, bacteriology, sanitary science and public health, toxicology, autopsies.

---

\*Not including one graduate who matriculated.

**REQUIREMENTS:** For admission: candidates for admission to the course leading to the degree of Doctor of Medicine, must be at least eighteen years old, and must present satisfactory testimonials of moral character from former instructors or physicians in good standing. As evidence that he has had a sufficient preliminary education, each candidate must present proof that he has passed the matriculation examination of some scientific, literary, or professional college in good standing; or present testimonials from the proper officer that he has pursued the course at some high school, academy, or preparatory school approved by the faculty; or he must pass an examination in the following subjects: English: an essay of about two hundred and fifty words on some familiar subject, to be announced at the time of the examination. 2. Mathematics: algebra to quadratics; geometry, Euclid, two books or their equivalent; metric system of weights and measures. 3. Physics: Balfour Stewart's Elementary Physics, or some equivalent work. These examinations are conducted in writing. Grammar, spelling and construction are considered in judging of the papers. These entrance examinations are also held in Chicago, Cincinnati and San Francisco on the Thursday following the June commencement. Students of any recognized medical school "may present themselves for examination three weeks before commencement and enter the examinations of the first one or two years, as they see fit"—the result of such examination determining their admission.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years medical study, "two of which must have been in a recognized medical college and the last of which must have been at this school;" and 4) pass the required examinations in all the studies of the three years' course; 5) satisfactory thesis.

**FEES:** Matriculation (paid once only), \$5; tuition for one year, \$125; for the third year, to those who have paid for and attended two full courses, \$75; graduation, \$30; anatomy, \$10 first term; \$5 second term.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	26	10	42+
1881-82	21	2	9.5
1882-83	32	7	21.9
1883-84	43	7	16.3
1884-85	27	6	22+
1885-86	26	6	23+
1886-87	25	8	32
1887-88	31	7	22.5
1888-89	32	2	6.2
1889-90	50*	7	14.

Percentage of graduates to matriculates for past ten years 19.8.

## DISTRICT OF COLUMBIA.

### NATIONAL MEDICAL COLLEGE.

(Medical Department of the Columbian University.)

WASHINGTON, D. C. A. F. A. KING, M. D., Dean, 726 Thirteenth street.

**ORGANIZED** in 1821, as the Medical Department of Columbian College. It was also authorized to use the title of National Medical College. In 1873 Columbian College became Columbian University. The first class was graduated in 1822. Operations were suspended from 1834 to 1838, and from 1861 to 1863. With these exceptions classes have been graduated each year since.

The faculty consists of seven professors, three demonstrators, two assistant demonstrators and two prosectors; nine professors on special subjects in the spring session.

**COURSE OF INSTRUCTION:** The curriculum of study consists of three annual graded courses of lectures. The regular yearly term began October 1, 1890, and will end March 1, 1891. A spring session is held during April and May. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, toxicology, medical jurisprudence, dermatology, ophthalmology, otology, diseases of women and children, histology, bacteriology, diseases of mind and nervous system, and laryngology.

**REQUIREMENTS:** For admission: "Matriculates will be required to show that they are fitted, by previous education, for the study of medicine, and for this purpose they must either submit themselves to an examination, or in lieu thereof present a satisfactory certificate of their attainments from some college, seminary or high school." Students who

\* Not including four graduates who matriculated.



have attended one course in any other regular medical school are placed on the same footing as second-course students of this college, and those who have attended two courses are admitted to the third-year class after passing a satisfactory examination on anatomy, physiology, chemistry and materia medica.

For graduation: 1) three years' study; 2) twenty-one years of age; 3) good moral character; 4) attendance on three courses of lectures; 5) satisfactory examinations at the end of second and third years; 6) dissection, at least two sessions; and 7) attendance on two courses of clinical instruction.

**FEES:** Matriculation (paid once only), \$5; lectures, \$100; examination, primary, \$20; final, \$15; single tickets, \$15.

**STUDENTS:** Number of matriculates and graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	44	5	11.3
1881-82	52	8	15.4
1882-83	79	10	12.6
1883-84	78	14	17.9
1884-85	86	14	16.2
1885-86	103	8	7.7
1886-87	97	15	15.4
1887-88	117	20	17.1
1888-89	122	20	16.3
1889-90	125*	20	16.

Percentage of graduates to matriculates for past ten years, 14.8.

#### UNIVERSITY OF GEORGETOWN, MEDICAL DEPARTMENT.

WASHINGTON, D. C. G. L. MAGRUDER, M. D., Dean, 815 Vermont Ave., N. W.

ORGANIZED in 1850. First class graduated in 1851; classes have been graduated each subsequent year.

Faculty consists of eight professors, eleven professors of special departments, three demonstrators, one assistant demonstrator and two lecturers.

**COURSE OF INSTRUCTION:** Graded, extending over three years and consisting of didactic and clinical lectures, recitations, demonstrations, and of dissecting and other practical manipulation during seven months of each year. Students are divided into first, second and third year classes. The session of 1890-91 commenced October 1, 1890, and will close April 11, 1891.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene and state medicine, histology, medical jurisprudence, ophthalmology, otology, laryngology, diseases of children, microscopy, toxicology. Class recitations are conducted by the members of the faculty, one hour every week being devoted to each branch; and at the close of each session class examinations are held upon the subjects of study of each of the three classes.

**REQUIREMENTS:** For admission: A written preliminary examination upon the ordinary branches of an English education, "for the purpose of ascertaining whether the candidate can profitably pursue the technical study of medicine, and of preventing those not qualified from wasting time and money." Graduates of colleges, high schools and academies are exempt from this preliminary examination. Students having attended one term at other medical colleges in good standing, will be admitted to the second course upon passing the examination exacted of students at the end of the first year; and candidates presenting certificates of examination from other medical colleges in good standing are admitted to the respective higher classes without further examination.

For graduation: 1) good moral character; 2) twenty-one years of age; 3) not less than three years' study; 4) three full courses of instruction; 5) two courses of practical anatomy; also, laboratory courses in histology, pathology and chemistry.

**FEES:** Matriculation (paid but once), \$5; first class (four tickets), \$60; second class (seven tickets), \$105; third class, \$60; demonstrator, \$10.

---

\*Not including three graduates who matriculated.

The small percentage of graduates in the District of Columbia is due mainly to the fact that many of the matriculates are government clerks and do not devote their whole time to study. They attend more courses and some go elsewhere to graduate.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	43	5	11.6
1881-82	30	7	23.3
1882-83	27	4	14.8
1883-84	34	7	20.5
1884-85	35	11	31.4
1885-86	30	10	33.3
1886-87	37	5	13.5
1887-88	45	12	26.6
1888-89	81	14	17.2
1889-90	84*	18	21.4

Percentage of graduates to matriculates for past ten years, 20.8.

#### HOWARD UNIVERSITY, MEDICAL DEPARTMENT.

WASHINGTON, D. C. CHARLES B. PURVIS, M. D., Secretary, 1118 Thirteenth street, N. W.

ORGANIZED in 1867. The first class graduated in 1871, and classes have been graduated each subsequent year.

The faculty consists of seven professors, five lecturers, one demonstrator.

COURSE OF INSTRUCTION: Comprises lectures, recitations, clinics and practical exercises. The twenty-third annual course of lectures commenced October 1, 1890, and will close March 1, 1891. Three courses of lectures are required to complete the curriculum; a course covering four years is earnestly recommended. The student is allowed to devote his first term to anatomy, physiology, chemistry and materia medica, but the second year must be given to all the subjects. The school has a summer session of six weeks beginning in April. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, pharmacy and botany, microscopy, histology, dental surgery, toxicology and diseases of children, laryngology, ophthalmology and otology.

REQUIREMENTS: For admission: Matriculates must be of good moral character; present a diploma from some good literary or high school, or a civil service examination certificate, or pass an examination sufficient to show that they have a good common school education.

For graduation: 1) twenty-one years of age and of good moral character; 2) three years' study including courses of lectures; 3) attended clinical lectures and dissections; 4) written and oral examination on required branches.

FEES: Demonstrator, \$5; material, \$9; lectures, \$60 per session.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	81	13	16+
1881-82	91	16	17+
1882-83	87	31	35+
1883-84	90	22	24.4
1884-85	85	25	29.4
1885-86	102	20	19.6
1886-87	79	20	25.3
1887-88	91	22	24.1
1888-89	104	24	23+
1889-90	92	26	28.2

Percentage of graduates to matriculates for past ten years, 24.2.

#### MEDICAL DEPARTMENT, NATIONAL UNIVERSITY.

WASHINGTON, D. C. H. H. BARBER, M. D., Dean, 1116 H Street, N. W.

ORGANIZED in 1884. The faculty consists of six professors, one demonstrator, one professor to chair of anatomy, and nine lecturers on special branches, one superintendent of the polyclinic.

COURSE OF INSTRUCTION: The seventh annual session began on the first Monday in October, 1890, and will end the last Thursday in April, 1891. Instruction will be given by lectures, recitations, clinics and practical exercises. "It is deemed advisable to divide the

\* Not including five graduates who matriculated.

course of studies into three years, advancing the student as he passes the required examinations of his respective class." Students who have begun their professional studies elsewhere are admitted to advanced standing upon passing the necessary examination. Women admitted upon same terms as men. The polyclinic is under the exclusive control of the faculty.

Lectures embrace: First year—anatomy, physiology, general chemistry and materia medica. Second year—practical and topographical anatomy, practical chemistry and toxicology, gynecology, materia medica and therapeutics, physiology, practice of medicine, surgery, and obstetrics. Third year—practice of medicine, pathological anatomy, surgery, obstetrics and the diseases of women and children, special branches. A course of lectures will also be given on medical jurisprudence.

**The Faculty most heartily recommend a four years' course, and will give special certificates of such attendance.**

**REQUIREMENTS:** For admission: "All candidates must pass an examination in subjects taught in our common schools, or present a certificate of sufficient general education from some recognized institution of learning."

For graduation: 1) good moral character; 2) at least twenty-one years of age; 3) three years' study; 4) satisfactory examination in all the subjects of the three years' course, "the last of which must have been in this college;" 5) certificate of demonstrator that the necessary dissections of the human body have been made.

**FEES:** Matriculation (once only), \$5; lectures, first year, (four tickets), \$70; second year, (seven tickets), \$105; third year, (three tickets), \$15; single tickets, \$15 each; demonstrator two years, each year, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1884-85	9	1	11
1885-86	10	1	10
1886-87	19	2	10.5
1887-88	14	1	7.1
1888-89	39	4	10.2
1889-90	42	6	14.2

Percentage of graduates to matriculates for past six years, 11.2.

Matriculates and graduates not printed in announcement for the year.

## FLORIDA.

### STATE BOARDS OF MEDICAL EXAMINERS OF FLORIDA.

Under the Florida "Act to regulate the practice of Medicine and to provide for the appointment of a Board of Medical Examiners in the State of Florida," approved May 31, 1889, there are eight examining boards in the State: a board of examiners for each judicial district, and a Homœopathic Board for the State at large. The boards meet semi-annually. Information has been received from two judicial district boards, the Fifth District and the Orange County Board. Up to March 7, 1890, the first had granted 64 licenses, and the second, up to November 24, 1890, had 18 applicants, "of whom 30 per cent. were rejected."

Dr. P. H. Strausz, of Palatka, is Secretary of the Fifth District Board. The Secretary of the Orange County Board is Dr. Fötser S. Chapman, of Orlands.

### BOARD OF HOMŒOPATHIC MEDICAL EXAMINERS.

JACKSONVILLE, Fla. C. W. JOHNSON, M. D., Secretary.

The secretary wrote on November 12, 1890: "We have granted 40 licenses and 4 temporary certificates, which are in force until the next meeting of the Board."

## UNIVERSITY OF FLORIDA, MEDICAL DEPARTMENT.

JACKSONVILLE, FLA.

ORGANIZED in 1883. Removed from Tallahassee to Jacksonville in 1885. Extinct, 1886.

## GEORGIA.

## MEDICAL COLLEGE OF GEORGIA.

*(Medical Department, University of Georgia.)*

AUGUSTA, Ga. EDWARD GEDDINGS, M. D., Dean of the Faculty.

ORGANIZED in 1829, as a Medical Academy, and has been in constant operation ever since, except during the period of the war. In 1872 it became the Medical Department of the State University of Georgia.

The faculty consists of seven professors, one lecturer, one demonstrator of anatomy, and one assistant.

COURSE OF INSTRUCTION: One course of lectures annually, beginning on the first Monday in October, continuing five months, and ending on the first of March. Graded course of three terms strongly recommended, but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, ophthalmology, otology, laryngology, diseases of children and pharmacy.

REQUIREMENTS: For admission: **None.**

"To those who intend to practice in States where such requirements are made, or who otherwise desire, opportunities will be given for examination in English composition, arithmetic, physics, Latin, Greek, and the modern languages, and certificates of such proficiency issued as may be exhibited by those examined."

For graduation: "A candidate for the degree of Doctor of Medicine must be at least twenty-one years of age, have attended two full courses of lectures in this or some other college in good standing, studied three years, and pass a satisfactory examination on all the branches taught in this institution."

FEES: Matriculation (paid once only) \$5; tickets, \$75; practical anatomy (paid once only) \$10; diploma, \$30.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	85	37	43.5
1884-85	77	34	44.1
1885-86	88	36	40.9
1886-87	102	46	45.1
1887-88	106	46	43.4
1888-89	102	51	50
1889-90	121	40	33+

Percentage of graduates to matriculates for the past seven years, 42.5.

## SOUTHERN BOTANICO-MEDICAL COLLEGE.

FORSYTH—MACON, Ga.

ORGANIZED in 1839 at Forsyth. Removed to Macon in 1846. First class graduated in 1841, and classes were graduated every year until 1854, when the name was changed to the Reform Medical College of Georgia—*vide infra*.

## THOMPSONIAN COLLEGE.

BARBOURVILLE, Ga.

ORGANIZED about 1850.—Extinct.

## SAVANNAH MEDICAL COLLEGE.

SAVANNAH, Ga.

ORGANIZED in 1853. Suspended during the civil war, 1861-66.—Extinct since 1889.

## REFORM MEDICAL COLLEGE OF GEORGIA.

MACON, Ga.

ORGANIZED in 1854, as the successor of the Southern Botanico-Medical College—*vide supra*. Classes were graduated every year until 1861; suspended during the civil war; resumed in 1867; classes graduated in 1868 and each subsequent year until 1874, when the school assumed the name of the College of American Medicine and Surgery—which see.

## ATLANTA MEDICAL COLLEGE.

ATLANTA, Ga. W. S. KENDRICK, M. D., Proctor of the College, 49 Washington street.

ORGANIZED in 1854. Closed during the rebellion, 1861-65. Reorganized in 1865. Classes were graduated from 1855 to 1861, inclusive, and each year since reorganization.

The faculty consists of eight professors, two assistants, four lecturers and one demonstrator.

COURSE OF INSTRUCTION: One course of lectures annually; the thirty-third session extends from October 1, 1890, to March 1, 1891.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology and diseases of children, of the eye, ear and throat, and medical jurisprudence. Instruction is also given in venereal diseases, diseases of the throat, minor surgery, and in laboratory work in chemistry.

REQUIREMENTS: For admission: **None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years study; 4) two full courses of lectures; 5) thesis, or a report of any of the clinics; 6) satisfactory examination.

FEES: Matriculation, \$5; demonstrator, \$10; full course, \$75; graduation, \$30.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	93	31	33.3
1881-82	135	56	41.4
1882-83	126	39	30.9
1883-84	114	48	42.1
1884-85	85	38	43.1
1885-86	109	38	34.8
1886-87	121	45	37.2
1887-88	114	54	47.3
1888-89	117	43	36.7
1889-90	135	49	36.2

Percentage of graduates to matriculates for past ten years, 38.2.

## OGLETHORPE MEDICAL COLLEGE.

SAVANNAH, Ga.

ORGANIZED in 1855, and continued its sessions until 1861.—Extinct.

## COLLEGE OF AMERICAN MEDICINE AND SURGERY.

ATLANTA, Ga.

ORGANIZED in 1874 as successor to the Reform Medical College at Macon. Removed to Atlanta in 1881—*vide supra*. The first class under this name was graduated in 1874. There was no graduating class 1877, '78, '79, '80 or '81. During the session of 1882-3 there was a class of 24 matriculates, of whom 14 were graduated at the close of the session; percentage of graduates to matriculates, *fifty-eight*. In 1884 the charter and effects of this institution were transferred to the Georgia College of Eclectic Medicine and Surgery.

## GEORGIA COLLEGE OF ECLECTIC MEDICINE AND SURGERY.

ATLANTA, Ga. G. W. DELBRIDGE, M. D., Proctor, 71½ Peachtree street.

ORGANIZED in 1877 as the Georgia Eclectic Medical College. After acquiring the charter of the College of American Medicine and Surgery, it assumed its present name in 1886 by virtue of an act passed by the State Legislature. The first class graduated in 1877, and classes have been graduated each subsequent year.

The faculty consists of six professors, two lecturers, one demonstrator, and one assistant demonstrator.

COURSE OF INSTRUCTION: The fifty-first annual session commenced on October 1, 1890, and will close March 1, 1891; spring course will begin March 1 and close June 1, 1891.

Lectures embrace physiology, anatomy, pathology, chemistry, toxicology, surgery, materia medica and therapeutics, theory and practice of medicine, medical jurisprudence and hygiene, nervous and venereal diseases, obstetrics, diseases of women and children, clinical surgery, urinary analysis, pharmacy, dermatology and hydro-therapeutics,

REQUIREMENTS: For admission: 1) the applicant must have read medicine at least one year under a competent instructor or preceptor. 2) Students must bring with them proper evidence of a competent knowledge of the branches of a preliminary education, such as English language and composition, mathematics, elementary physics, chemistry, etc., or they will be required to pass a satisfactory examination on the same before a committee of the faculty. Any applicant holding a diploma from a reputable college or scientific school, or a literary high school, or a first grade teacher's certificate, will be excused from this examination.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) thesis; 5) must have dissected the greater part of the term; 6) "must have been diligent in attending the lectures and clinics;" 7) "thorough examination on the respective branches taught in the college."

FEES: Matriculation, \$5; lectures, \$56; demonstrator, \$5; graduation, \$25. Dissecting material at cost; lectures, spring course, \$30.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1886-87	50	22	44
1887-88	57	21	36.8
1888-89	40	19	47.5
1889-90	46	16	34.7

Percentage of graduates to matriculates for past five years, 40.4.

## SOUTHERN MEDICAL COLLEGE.

ATLANTA, Ga. WM. PERRIN NICHOLSON, M. D., Dean, P. O. Box No. 234.

ORGANIZED 1879. Faculty consists of eight professors, two lecturers and one demonstrator.

COURSE OF INSTRUCTION: One annual lecture course, the twelfth session beginning October 7, 1890, and continuing until the first week in March, 1891. Hospital and dispensary clinics are given, and quizzes by the professors to such students as desire them.

Three courses of lectures recommended, but not required.

Lectures embrace principles and practice of medicine, obstetrics, diseases of women and children, physiology, hygiene, medical jurisprudence, surgery, anatomy, materia medica, therapeutics, toxicology, diseases of the eye, ear and throat, chemistry, venereal diseases, dermatology, histology and pathology.

**REQUIREMENTS:** For admission: **None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) "he must have dissected the different parts of the body in this or some other regular school;" 5) "must undergo a personal and satisfactory examination before the faculty—examination must occur at close of session;" 6) thesis, or report of clinic.

**FEES:** Matriculation, (paid once), \$5; tickets, full course, \$75; demonstrator, \$10; diploma, \$30; single tickets, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	105	38	36.1
1881-82	126	37	29.3
1882-83	104	37	35.5
1883-84	86	27	31.3
1884-85	89	31	34.8
1885-86	82	34	41.4
1886-87	80	30	37.5
1887-88	76	32	42.1
1888-89	79	35	44.3
1889-90	81	33	40.7

Percentage of graduates to matriculates for past ten years, 35.9.

#### CLARK UNIVERSITY, MEDICAL DEPARTMENT.

ATLANTA, Ga.

CHARTERED in 1886. Organization never completed.

#### WOMAN'S MEDICAL COLLEGE OF GEORGIA AND TRAINING SCHOOL FOR NURSES.

ATLANTA, Ga. J. W. STONE, M. D., Dean, P. O. Box No. 215.

ORGANIZED 1889. Faculty consists of seven professors, five lecturers, and one demonstrator of anatomy.

**COURSE OF INSTRUCTION:** One annual course; the second session began October 1, 1890, and will close March 1, 1891. Practical and clinical teaching will have precedence over didactic or mere ornamental education. Efforts will be made to afford each student the advantage of attending one or more cases of midwifery in each term, in addition to outside charity practice.

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica and therapeutics, practice of medicine, surgery, obstetrics, diseases of women and children, botany, histology, medical jurisprudence; dissecting is obligatory.

**REQUIREMENTS:** For admission: applicant must be of good moral character, have fair education, and be not less than eighteen years of age.

For graduation: 1) must be of legal age; 2) attendance upon two full courses of lectures; 3) thesis; 4) satisfactory examinations.

**FEES:** Matriculation, \$5; lectures, \$70; demonstrator, \$10; material at cost; graduation, \$25; scholarship, \$145.

**STUDENTS:** Number of matriculates and of graduates at the session reported and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1889-90	10	1	10

**After March, 1892, this college will require attendance on three annual sessions.**

## ILLINOIS.

## AN ACT TO REGULATE THE PRACTICE OF MEDICINE IN THE STATE OF ILLINOIS.

Passed June 15, approved June 16, and in force July 1, 1887.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That no person shall practice medicine in any of its departments in this state unless such person possesses the qualifications required by this act. If a graduate in medicine, he must present his diploma to the State Board of Health for verification as to its genuineness. If the diploma is found genuine, and from a legally chartered medical institution in good standing, and if the person named therein be the person claiming and presenting the same, the State Board of Health shall issue its certificate to that effect signed by all the members thereof, and such certificate shall be conclusive as to the right of the lawful holder of the same to practice medicine in this state. If not a graduate, the person practicing medicine in this state shall present himself before said board and submit himself to such examination as the board may require, and if the examination be satisfactory to the board, the said board shall issue its certificate in accordance with the facts, and the lawful holder of such certificate shall be entitled to all the rights and privileges herein mentioned.

§ 2. The State Board of Health shall organize within three months after the passage of this act, it shall procure a seal, and shall receive through its secretary, applications for certificates and examinations; the president and secretary shall have the authority to administer oaths, and the board to take testimony in all matters relating to its duties; it shall issue certificates to all who furnish satisfactory proof of having received diplomas or licenses from legally chartered medical institutions in good standing as may be determined by the board; it shall prepare three forms of certificates, one for persons in possession of such diplomas or licenses, the second for candidates examined and favorably passed on by the board, and a third for persons to whom certificates may be issued as hereinafter provided in section 12 of this act; it shall furnish to the county clerks of the several counties a list of all persons receiving certificates. In selecting places to hold its meetings, it shall, as far as is reasonable, accommodate applicants residing in different sections of the state, and due notice shall be published of all its meetings for examination. Certificates shall be signed by all the members of the board, and the secretary of the board shall receive from the applicant a fee of five (5) dollars for each certificate issued to such graduate or licentiate. Graduates or licentiates in midwifery to pay the sum of two (2) dollars for each certificate. All such fees for certificates shall be paid by the secretary into the treasury of the board.

§ 3. The verification of the diploma shall consist in the affidavit of the holder and applicant that he is the lawful possessor of the same, and that he is the person therein named. Such affidavit may be taken before any person authorized to administer oaths, and the same shall be attested under the hand and official seal of such officer, if he have a seal; and any person swearing falsely shall be deemed guilty of perjury, and punished accordingly. Graduates may present their diplomas and affidavits as provided in this act, by letter or by proxy, and the State Board of Health shall issue its certificate the same as though the owner was present.

§ 4. All examinations of persons not graduates or licentiates, shall be made directly by the board, and the certificates given by the board shall authorize the possessor to practice medicine and surgery in the State of Illinois.

§ 5. Every person holding a certificate from the State Board of Health shall have it recorded in the office of the clerk of the county in which he resides, within three months from its date, and the date of recording shall be indorsed thereon. Until such certificate is recorded as herein provided the holder thereof shall not exercise any of the rights or privileges conferred therein to practice medicine. Any person removing to another county to practice shall record the certificate in like manner, in the county to which he removes, and the holder of the certificate shall pay to the county clerk the usual fee for making the record.

§ 6. The county clerk shall keep, in a book provided for the purpose, a complete list of the certificates recorded by him, with the date of the issue of the certificate. If the certificate be based on a diploma or license, he shall record the name of the medical institution conferring it, and the date when conferred. The register of the county clerk shall be open to public inspection during business hours.

§ 7. The fees for the examination of non-graduates shall be as follows: Twenty (20) dollars for an examination in medicine and surgery; ten (10) dollars for an examination in midwifery only; and said fees shall be paid into the treasury of the board. If an applicant fails to pass said examination his or her fee shall be returned. Upon successfully passing the examination the certificate of the board shall be issued to the applicant without further charge.

§ 8. Examinations may be made in whole or in part in writing, and shall be of an elementary and practical character, but sufficiently strict to test the qualifications of the candidate as a practitioner.

§ 9. The State Board of Health may refuse to issue the certificates provided for in section 2 to individuals guilty of unprofessional or dishonorable conduct, and it may revoke such certificates for like causes. In all cases of refusal or revocation the applicant may appeal to the Governor, who may affirm or overrule the decision of the board, and this decision shall be final.



§ 10. Any person shall be regarded as practicing medicine, within the meaning of this act, who shall treat, operate on, or prescribe for any physical ailment of another. But nothing in this act shall be construed to prohibit service in cases of emergency, or the domestic administration of family remedies. And this act shall not apply to commissioned surgeons of the United States Army, Navy or Marine Hospital service in the discharge of their official duties.

§ 11. Any itinerant vendor of any drug, nostrum, ointment or appliance of any kind intended for the treatment of disease or injury, or who shall, by writing or printing or any other method, profess to cure or treat disease or deformity, by any drug, nostrum manipulation or other expedient, shall pay a license of one hundred (100) dollars per month into the treasury of the board, to be collected by the State Board of Health, in the name of the People of the State of Illinois, for the use of said Board of Health. And it shall be lawful for the State Board of Health to issue such license on application made to the State Board of Health, such license to be signed by the president of the board, and attested by the secretary of the board, with the seal of the board. Any such itinerant vendor who shall vend or sell any such drug, nostrum, ointment or appliance without having a license so to do, shall, if found guilty, be fined in any sum not less than one hundred dollars, and not exceeding two hundred dollars for each offense, to be recovered in an action of debt before any court of competent jurisdiction. But such board may for sufficient cause refuse such license.

§ 12. Any person practicing medicine or surgery in the State without the certificate issued by this board, in compliance with the provisions of this act, shall for each and every instance of such practice forfeit and pay to the People of the State of Illinois for the use of the said State Board of Health the sum of one hundred (100) dollars for the first offense, and two hundred (200) dollars for each subsequent offense, the same to be recovered in an action of debt before any court of competent jurisdiction, and any person filing or attempting to file as his own the diploma or certificate of another, or a forged affidavit of identification, shall be guilty of a felony, and upon conviction, shall be subject to such fine and imprisonment as are made and provided by the statutes of the State for the crime of forgery. *Provided*, that all persons who have been practicing medicine continuously for ten years within this State prior to the taking effect of the act to which this is an amendment, and who have not under said original act obtained a certificate from the said Board of Health to practice medicine in this State, shall upon proper application to said Board of Health receive such certificate, unless it shall be ascertained and determined by said Board of Health that the person so applying for a certificate is of immoral character, or guilty of unprofessional or dishonorable conduct, in which case, said Board of Health may reject such application: *And, provided*, that such application for a certificate shall be made within six months after the taking effect of this act, and all persons holding a certificate on account of ten years' practice shall be subject to all the requirements and discipline of this act, and the act to which this is an amendment, in regard to their future conduct in the practice of medicine the same as all other persons holding certificates, and all persons not having applied for or received such certificate within six months after the taking effect of this act, and all persons whose applications have for the causes herein named been rejected or certificates revoked, shall, if they shall practice medicine, be deemed guilty of practicing in violation of law and shall suffer the penalties herein provided.

§ 13. Upon conviction of either of the offenses mentioned in this act, the court shall as a part of the judgment, order that the defendant be committed to the common jail of the county until the fine and costs are paid, and upon failure to pay the same immediately, the defendant shall be committed under said order. *Provided*, that either party may appeal in the same time and manner as appeals may be taken in other cases except that where an appeal is prayed in behalf of the people, no appeal bond shall be required to be filed, whether the appeal be from a justice of the peace, or from the county or circuit court, or from the appellate court. But it shall be sufficient in behalf of the People of the State of Illinois, for the use of the State Board of Health, to pray an appeal, and thereupon appeal may be had without bond or security.

§ 14. All acts and parts of acts inconsistent or in conflict with this act are hereby repealed.

## ILLINOIS STATE BOARD OF HEALTH.

SPRINGFIELD, Ill. JOHN H. RAUCH, M. D., Secretary.

**ORGANIZED** July, 1877. Consists of seven members, appointed by the Governor of the State, for the term of seven years each. Its relations with medical education and medical colleges arise from the duties devolved upon it, and the powers and authority vested in it, by the Act to Regulate the Practice of Medicine in the State of Illinois, approved June 16, 1887, in force July 1, 1887. Among such duties, powers and authority are the examination and verification of diplomas presented as the basis for certificates entitling their lawful holders to practice medicine within the State, and the issue of such certificates; the determination of the standing of legally chartered medical institutions; the examination of non-graduates as to their qualification as practitioners, and the issue of certificates or licenses to practice to such as pass satisfactory examinations; the refusal of certificates to individuals guilty of unprofessional and dishonorable conduct, and the revocation of certificates for like causes. The law applies also to midwives.

Since its organization, and up to the date of its revision, January 1, 1891, the BOARD has examined and verified the diplomas and licenses of 275 institutions and licensing bodies. Of this number it has definitely rejected the diplomas of 28 institutions, on ground of fraud or other gross invalidity; it has required the diplomas of 26 other institutions to be supplemented by examination; and it has issued certificates based on the diplomas of legally-chartered medical institutions in good standing to 9,212 practitioners, and to 263 others on diplomas supplemented by examination. These last (the 263) have only been issued since the enforcement of the Schedule of Minimum Requirements; that is, to graduates of the sessions since 1882-83.

Of the total number of applicants for certificates on diplomas, 2,283 were rejected or withdrew their applications, or were unable to complete them, or in some other manner failed to comply with the requirements of the law; and these, as a rule, either abandoned practice or left the State. In a number of cases, however, the rejected or defective candidates subsequently attended lectures at a reputable medical college, were graduated therefrom, and certificates were issued them upon their diplomas.

The foregoing figures and comments refer only to applicants for certificates based upon diplomas, and do not embrace the non-graduates and exempts. Including these the law has applied to a total of 15,283 individuals, exclusive of midwives. Of this number there are now in practice in the State, in round numbers, about 6,200 physicians, classified as follows: 1. Graduates holding certificates based upon diplomas, licenses of legally chartered medical institutions in good standing as defined by the BOARD. 2. Graduates since the session of 1882-83, whose diplomas were required to be supplemented by examination in order to conform to the standard of Minimum Requirements of the BOARD. 3. Non-graduates who have passed the examination prescribed by the law. 4. Non-graduates by reason of having been engaged in practice in the State upwards of 23 years prior to July 1, 1890.

The number of rejected applicants shows a diminution of late years, as the requirements of the law come to be more clearly defined and more generally understood. For the entire period the percentage of rejections and withdrawals has been 13.7; but during the past two years they have averaged only 8.7 per cent.—In 1884 there were 117 in 597 applicants, in 1885 there were 114 in 575 applicants. In 1886 there were 74 in 514 applicants. In 1887 there were 69 in 523 applicants. In 1888 there were 50 in 455 applicants. In 1889 there were 60 in 558 applicants. In 1890 there were 42 in 533 applicants. Refusals of certificates are based upon one or more of the following grounds:

1. Failure to present a diploma from a legally-chartered medical institution in good standing, as defined by the BOARD.
2. Failure to sustain a satisfactory examination sufficiently strict to test the qualifications of the candidate for the practice of medicine.
3. Personal or professional antecedents, habits or associations, warranting the charge of unprofessional or dishonorable conduct.
4. Proved intent to practice in an unprofessional and dishonorable manner, as by claiming to cure incurable maladies; to possess unusual skill, experience or facilities; and similar claims involving deceit and fraud upon the public.

The BOARD has revoked 42 certificates for unprofessional and dishonorable conduct.

Non-graduate applicants for license to practice in Illinois are required to submit to examination in accordance with the following provisions of the Medical-Practice Act:

**THE STATE BOARD OF HEALTH** \* \* \* shall receive through its Secretary applications for certificates and examinations. \* \* \* If not a graduate, the person practicing medicine in this State shall present himself before said BOARD, and submit himself to such examination as said BOARD shall require; and if the examination be satisfactory to the examiners, the said BOARD shall issue its certificate in accordance with the facts, and the lawful holder of such certificate shall be entitled to all the rights and privileges herein mentioned.

§ 3. \* \* \* It shall prepare three forms of certificates, one for persons in possession of diplomas or licenses; one for candidates examined by the BOARD; and a third for such persons who have been engaged in the practice of medicine for upwards of 23 years, and shall furnish to the county clerks of the several counties a list of all persons receiving certificates.

§ 8. Candidates for examination shall pay a fee of twenty dollars, in advance, which shall be returned to them if a certificate be refused.

§ 9. Examinations may be made wholly or in part in writing, and shall be of an elementary and practical character, but sufficiently strict to test the qualifications of the candidate as a practitioner.

All examinations of persons not graduates or licentiates must be made directly by the BOARD, and the certificate given by the BOARD authorizes the possessor to practice medicine and surgery in the State of Illinois.

Where the candidates have any special views of theory and practice of medicine, or of therapeutics, respect is paid to such views, and they are allowed upon request, to appear before individual members of the BOARD for special examination in such branches. Examinations are conducted in the English language. If made in another language, interpreters must be furnished at the expense of the applicant.

All candidates must pass a preliminary examination, such as is indicated in the "Minimum Requirements," and must fill out the following:

*Application for Examination before the Illinois State Board of Health, under the Act to Regulate the Practice of Medicine in the State of Illinois.*

1. Name in full .....
  2. Nativity and age—(must be at least twenty-one years of age).....
  3. Residence and postoffice.....
  4. Time spent in professional studies—(must be at least three years).....
  5. Physician or preceptor under whom the studies were pursued, with postoffice address—(must be a licentiate of the BOARD or reputable practitioner).....
  6. Courses of medical lectures attended.....
  7. Name of medical school attended—(time spent at schools not recognized by the BOARD will not be counted).....
  8. Time spent in hospital, if any.....
  9. Time of practice, if any.....
  10. School of practice chosen.....
  11. References as to character (must present certificate of good character from two licentiates of the BOARD or other reputable practitioners).....
- Approved.....189....

.....  
President of the Board.

*Subjects of Examination.*

- 1) Anatomy; 2) materia medica; 3) theory and practice; 4) gynecology; 5) physiology; 6) pathology; 7) obstetrics; 8) chemistry; 9) surgery; 10) hygiene; 11) medical jurisprudence.

Eighty per cent. of correct answers required.

We have examined this applicant and find him to stand as above.

Signed by the members of the BOARD.

NUMBER of candidates examined, 781. Number of candidates licensed, 249. Of these two-thirds have since graduated.

These examinations are independent of those of graduates of colleges that do not fully comply with the Schedule of Minimum Requirements of the BOARD, and these examinations are confined to the branches or subjects omitted by the given college.

At the April, 1886, meeting of the BOARD, the following preamble and resolution were adopted:

WHEREAS, The continuous graduation of forty-five (45) per cent. of the total number of matriculates of a medical college—due allowance being made for the average annual loss—must be accepted as *prima facie* evidence that practically, every candidate is graduated without regard to competency or qualification; therefore, be it

Resolved, That no medical college be recognized as in good standing within the meaning and intent of the Act to Regulate the Practice of Medicine in the State of Illinois, the aggregate graduates of which college amount to forty-five (45) per cent. of its aggregate matriculates during any period of five years ending with a session subsequent to the session of 1885-86.

At the July, 1887, meeting of the Board, the following resolution was adopted:

Resolved, That the phrase "medical colleges in good standing," in the 1st section of the "Act to Regulate the Practice of Medicine in the State of Illinois," approved June 16, 1887, is hereby defined to include only those colleges which shall, after the sessions of 1890-91, require four years of professional study, including any time spent with a preceptor, and three regular courses of lectures, as conditions of graduation, and shall otherwise conform to the Schedule of Minimum Requirements heretofore adopted by the Board.

At a meeting of the BOARD held at Chicago May 24, 1889, the following resolution was adopted:

*Resolved*, That by authority of the "Act to Regulate the Practice of Medicine" in the State of Illinois, approved June 16, 1887, the following Schedule of Minimum Requirements for Schools of midwifery be, and is hereby adopted.

- I. Length of Regular Graduating Courses. The time occupied in the regular courses or sessions from which students are graduated, shall amount to not less than six months.
- II. Instruction must include the following branches of medical science: 1. Anatomy of the pelvis, and of the generative organs of women. 2. Physiology of menstruation and conception. 3. The signs of pregnancy. 4. Mechanism of labor. 5. Management of normal labor. 6. Management of abnormal labor. 7. Puerperal hygiene and anti-sepsis. 8. Special care of mother and infant.

When there is any doubt as to the requirements of a college whose diploma is offered to the Board for recognition, the following affidavit is required:

STATE OF ..... } ss  
..... COUNTY. }

being duly sworn, deposes and says that he is the\* ..... of the ..... of ..... of ..... and that the following "Schedule of Minimum Requirements," adopted by the ILLINOIS STATE BOARD OF HEALTH as the test of the good standing of a medical college, entitling its diplomas to recognition in that State, is fully complied with by said medical college, to-wit:

#### SCHEDULE OF MINIMUM REQUIREMENTS.

I. CONDITIONS OF ADMISSION TO LECTURE COURSES.—1. Credible certificates of good moral standing. 2. Diplomas of graduation from a good literary and scientific college or high school, or a first-grade teacher's certificate. Or, lacking this—a thorough examination in the branches of a good English education, including mathematics, English composition, and elementary physics or natural philosophy.

II. BRANCHES OF MEDICAL SCIENCE TO BE INCLUDED IN THE COURSE OF INSTRUCTION.—1. Anatomy. 2. Physiology. 3. Chemistry. 4. Materia Medica and Therapeutics. 5. Theory and Practice of Medicine. 6. Pathology. 7. Surgery. 8. Obstetrics and Gynecology. 9. Hygiene. 10. Medical Jurisprudence.

III. LENGTH OF REGULAR OR GRADUATING COURSES.—1. The time occupied in the regular courses or sessions from which students are graduated shall not be less than five months, or twenty weeks, each. 2. Two full courses of lectures, not within one and the same year of time, shall be required for graduation with the degree of Doctor of Medicine.

IV. ATTENDANCE AND EXAMINATIONS OR QUIZZES.—1. Regular attendance during the entire lecture courses shall be required, allowance being made only for absences occasioned by the student's sickness, such absence not to exceed twenty per centum of the course. 2. Regular examinations or quizzes to be made by each lecturer or professor daily, or at least twice each week. 3. Final examinations on all branches to be conducted, when practicable, by competent examiners other than the professors in each branch.

V. DISSECTIONS, CLINICS AND HOSPITAL ATTENDANCE.—1. Each student shall have dissected during two courses. 2. Attendance during at least two terms of clinical and hospital instruction shall be required.

VI. TIME OF PROFESSIONAL STUDIES.—This shall not be less than three full years before graduation, including the time spent with a preceptor, and attendance upon lectures or at clinics and hospital.

VII. INSTRUCTION.—The college must show that it has a sufficient and competent corps of instructors, and the necessary facilities for teaching, dissections, clinics, etc.

Also that said requirements have been enforced with regard to ..... and that the lists or numbers of matriculates and graduates, as published annually in the announcements of said medical college, are correct.

[SEAL] Subscribed and sworn to before me, this ..... day of ....., A. D. 189...

Notary Public.

#### RUSH MEDICAL COLLEGE.

(The Medical Department of the Lake Forest University.)

CHICAGO, ILL. JAMES H. ETHERIDGE, A. M., M. D., Secretary, 1634 Michigan avenue.

ORGANIZED in 1842. First class graduated in 1843, and classes have been graduated each subsequent year.

\* Give title—such as Dean, Secretary, etc.

† Give full name of College or Institution.

Faculty consists of fourteen professors, two professors of special departments, and twenty adjunct professors, lecturers, assistants and demonstrators.

**COURSE OF INSTRUCTION:** "Instruction is given in this institution by lectures, clinics, practical work in the dissecting room and laboratories, and by repeated oral examinations. The faculty desire that the matriculates shall pursue their studies in the college during three spring and three winter terms. To encourage this complete curriculum of study, such students will be registered as special faculty students, and at the end of their second winter term, they will be admitted to final examinations in anatomy, physiology, chemistry, materia medica and therapeutics." The forty-eighth (winter) session began September 30, 1890, and will continue twenty-six weeks. The spring session of 1891 begins April 1, 1891, and will continue till May 31st. Three years graded course is advised but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica, surgery, principles and practice of medicine, obstetrics, hygiene, medical jurisprudence, genito-urinary diseases, diseases of women and children, dermatology and venereal diseases, ophthalmology, otology, laryngology, dental pathology and surgery, toxicology, and one course of practical pathology and physiology.

**REQUIREMENTS:** For admission: "Students who commence their course of studies in Rush Medical College are required to furnish testimonials of sufficient preliminary education, either in the form of a diploma from a literary or scientific college, academy or high school, or of a certificate of examination for admission to such an institution, or a teacher's certificate of the first grade. Graduates in medicine, previous matriculates of this college, and students who desire to pursue a special course without graduation, will be admitted without credentials or examination. Students who have completed a full course of preparation for admission to the college may, by special arrangement, be received on the certificates of their instructors. Students who cannot furnish other evidence of a sufficient preliminary education, will be admitted on condition of passing an examination in writing in the branches of a good English education, including mathematics and elementary physics."

Candidates for the advanced classes in the college must furnish satisfactory evidence of preliminary education, and of an amount of study and college attendance equivalent to that which has been required of the members of the classes to which they seek admission.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years study; 4) two full courses of lectures. **After 1891, three full courses not delivered in the same twelvemonth.** "The lectures of the spring term cannot be considered as a *course of lectures* in this requirement;" 5) clinical instruction for two terms; 6) dissection of each region of the body; 7) one course in practical chemistry; 8) one practical course in the laboratory of physiology and pathology; 9) one practical course in auscultation and percussion; one in obstetrical manipulations; one in surgical operations; 10) full and satisfactory written or oral examination on each branch taught in the college.

**THE DEGREE CUM LAUDE** is conferred upon candidates, not graduates in medicine, who have not been unsuccessful in a previous examination for the degree in medicine; who have attended three courses of six months each, (each equivalent to a course in this college) the last in this institution; who have studied medicine four years and passed a satisfactory final examination in letters, general science and medicine, and who have fulfilled all other requirements for graduation in this college.

**FEES:** Matriculation, \$5; lectures, \$30; demonstrator, \$10; chemical laboratory, \$7; laboratory of physiology, pathology and bacteriology, \$7; demonstrations in surgery, \$5; final examination, \$30. The materials for laboratory work are furnished at cost price. For the annual spring course—matriculation, \$5; lectures, \$20; (this amount will be deducted from the fees of the next following winter session); chemistry, \$7; demonstrator, \$10; laboratory of physiology and pathology, \$7; hospital and infirmary, \$5 each; demonstrations in surgery, \$5. "Graduates of the college are admitted on the payment of the matriculation fee only; graduates of other regular medical colleges on the payment of matriculation fee and one-half lecture fees."

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Sessions.	Matriculates.	Graduates.	Percent.
1880-81	559	172	30.7
1881-82	583	185	31.7
1882-83	549	183	33.3
1883-84	451	166	36.8
1884-85	419	150	35.8
1885-86	404	156	38.6
1886-87	374	133	35.5
1887-88	389	135	34.7
1888-89	413	136	32.9
1889-90	495*	161	32.5

Percentage of graduates to matriculates for past ten years, 34.

**NOTE.**—"After the year 1890-91 no graduate, unless he has studied medicine four years, and taken three courses of lectures of at least five months each, as required in Illinois (and six months each in Iowa), can commence the practice of medicine in these States without passing a rigid examination before the STATE BOARD OF HEALTH. Every student who intends to commence the study of medicine, and wishes to comply with the laws of these States, should enter his name as early as possible with a preceptor."

\*Not including twenty-four graduates who matriculated.

# MEDICAL DEPARTMENT OF ILLINOIS COLLEGE.

JACKSONVILLE, Ill.

ORGANIZED in 1843. Suspended lectures in 1848.

Instruction was given to about seventy-five students, and thirty-seven were graduated.

# MEDICAL DEPARTMENT, UNIVERSITY OF ST. CHARLES.

ST. CHARLES, Ill.

ORGANIZED in 1844. After one course of lectures was delivered it became extinct.

# COLLEGE OF PHYSICIANS AND SURGEONS OF THE UPPER MISSISSIPPI.

ROCK ISLAND, Ill.

One course of lectures was delivered in the winter of 1848-49. Removed to Davenport, Iowa, where a second course was delivered in the winter of 1849-50. Then removed to Keokuk, Iowa, and assumed the name of College of Physicians and Surgeons.

# CHICAGO MEDICAL COLLEGE.

(Medical Department of the Northwestern University.)

CHICAGO, Ill. FRANK BILLINGS, M. D., Secretary, 235 State street.

ORGANIZED in 1859, as the Medical Department of Lind University. In 1864 it severed this connection and assumed the name of the Chicago Medical College. The school entered into its present university relations in 1869.

The faculty consists of twenty-one professors, three lecturers, four demonstrators, two assistant demonstrators, two clinical assistants, one director bacteriological laboratory.

**COURSE OF INSTRUCTION:** Graded, comprising three annual consecutive courses of lectures. The faculty earnestly recommends a four years' course. Students who take this course, and receive in all branches a general average of eight or more on a scale of ten, will be graduated *cum laude*.

The thirty-second annual session began September 30, 1890, and will end April 28, 1891. □

Lectures embrace: First year—Descriptive anatomy, physiology, normal histology, general chemistry, laboratory work in chemistry and normal histology, and practical anatomy. Second year—descriptive and surgical anatomy and operative surgery, general pathology and pathological anatomy, materia medica and therapeutics, state medicine, physical diagnosis, medical chemistry, obstetrics, laryngology and rhinology, surgical operations on the cadaver and course in bandaging, laboratory work in chemistry and pathological histology and hospital and dispensary clinics. Third year—theory and practice of medicine and clinical medicine, theory and practice of surgery and clinical surgery, gynecology, obstetrics, dermatology, diseases of children, ophthalmology and otology, nervous and mental diseases, medical jurisprudence, and college dispensary and hospital clinics. Attendance upon clinics obligatory, second and third years.

**REQUIREMENTS:** For admission: Applicants for admission must present diplomas or certificates from recognized colleges, schools of science, academies or high schools, or teachers' certificates of the first or second grade, or sustain an examination in the following subjects: English composition, arithmetic, geography, and at the option of the candidate either one of the following subjects: a) Latin; b) German; c) Physics. Accredited certificates of one years' study entitle holders to enter as second-course students after satisfactory examination in studies of first-year course. Certificates of two years' study and of attendance on one full course of lectures entitle to entry as third-course students after examination in studies of first and second year.

For graduation: 1) evidence of good moral character; 2) three years' study; 3) required age, at least twenty-one years; 4) attendance upon three courses of lectures of seven months each, unless admitted to advanced standing by examination; 5) dissection of at least three parts of the human body; 6) at least two terms of hospital attendance; 7) passing all examinations; 8) satisfactory thesis.

**FEES:** Lecture fee for first, second and third collegiate years, \$100 each year; deposit against brokerage in laboratory (returnable) first year, \$5; second year, \$3; hospitals \$5 and \$6. No special charges for demonstrator tickets, laboratory courses or anatomical material. The fees for the graduating classes of 1891 and 1892 will be as heretofore, \$5 matriculation fee, and \$30 final examination fee, (not returnable.)

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	152	45	32.2
1881-82	155	39	25.1
1882-83	137	42	30.6
1883-84	114	41	35.9
1884-85	119	41	34.4
1885-86	125	38	30.4
1886-87	134	43	32
1887-88	169	34	20.1
1888-89	206	46	22.3
1889-90	235*	50	21.2

Percentage of graduates to matriculates for the past ten years, 27.1.

\*Not including two graduates who matriculated.

### HAHNEMANN MEDICAL COLLEGE AND HOSPITAL.

CHICAGO, Ill. E. S. BAILEY, M. D., Registrar, 3034 Michigan avenue.

**ORGANIZED** in 1859. The first class was graduated in 1860. Classes have been graduated each subsequent year.

The faculty consists of seventeen professors, five adjunct professors, two lecturers and a demonstrator of histology and microscopy.

**COURSE OF INSTRUCTION:** One annual graduating course of lectures. The thirty-first regular session began September 16, 1890, and ends March 19, 1891. The plan of teaching is "largely clinical and objective." "A post-graduate course, chiefly designed for physicians, is held in the spring months." Daily and weekly quizzes are conducted by the professors in person. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine and medical jurisprudence, pathology, surgery, obstetrics and gynecology, hygiene, toxicology, ophthalmology and otology, laryngology, rhinology, histology, minor and operative surgery, dental surgery.

**REQUIREMENTS:** For admission: "Upon application for admission each student must present to the registrar satisfactory evidence of a good English education. Such as are graduates of a literary or scientific college, academy or high school, or who has passed the entrance examination to a literary college in good standing; who have a county or first-grade teacher's certificate; graduates in medicine, and students who desire to pursue a special course of study—other than for the purpose of securing the degree—will be exempt from this requirement, provided they furnish the documentary evidence to the registrar. Lacking such credentials from former teachers, the student must pass a fair but not technical examination, before a committee of faculty appointed for that purpose."

For graduation: 1) twenty-one years of age; 2) must have pursued the study of medicine for at least three years, attended two full courses of lectures and dissected at least two parts or during two courses; 3) candidates must pass all the regular examinations.

**This College will require four years of study and three regular courses of lectures after the session of 1890-91.**

**FEES:** Matriculation, \$5; for full course of lectures including matriculation, \$65; final examinations, \$25; demonstrator, (including material), \$10; perpetual ticket, \$150; Cook County Hospital (optional) \$5; single tickets, \$10 each; Hahnemann Hospital sub-clinic, for advanced students and graduates, \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	195	100	51.2
1881-82	264	108	40.9
1882-83	297	134	45.1
1883-84	259	113	43.6
1884-85	214	93	38.1
1885-86	227	92	40.5
1886-87	184	86	46.7
1887-88	173	80	46.2
1888-89	197	78	39.5
1889-90	232*	96	41.3

Percentage of graduates to matriculates for past ten years, 43.

**For requirements of the American Institute of Homœopathy in regard to admission and graduation in 1892, see Introductory Remarks.**

\* Not including eleven graduates who matriculated.

## BENNETT COLLEGE OF ECLECTIC MEDICINE AND SURGERY.

CHICAGO, ILL. H. S. TUCKER, M. D., Secretary, 513 State street.

ORGANIZED in 1868. First class graduated in 1869. Classes have graduated each subsequent year.

The faculty consists of eighteen professors, one demonstrator and one lecturer.

**COURSE OF INSTRUCTION:** **Three courses of lectures and four years' of study are requisite for graduation.** Instruction is imparted by didactic and clinical lectures, daily quizzes and laboratory work. The session of 1890-91 began September 24, 1890, and continues six months, closing March 24, 1891. Post Graduate Polyclinic commences April 1, 1891, and is in session throughout the year.\*

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, orthopedy, ophthalmology and otology, venereal diseases and dermatology, diseases of children, electro-therapeutics, pharmacy, toxicology, insanity, theory and practice of medicine, rhinology, laryngology, osteology, microscopy, diseases of the nervous system.

**REQUIREMENTS:** For admission: Credible certificates of good moral character, and a good elementary English education, "including mathematics, English composition and elementary physics or natural philosophy, as attested by the presentation of a diploma of graduation from some literary and scientific college or high school, or a first-grade teacher's certificate, or by a creditable examination upon those branches by a committee appointed for that purpose."

For graduation: 1) the candidate must possess satisfactory references as to good moral character and have attained the age of twenty-one years; 2) **four years' study**; 3) must have attended not less than **three courses of lectures** the last of which must have been in this college; 4) must have completed the prescribed course of analytical chemistry and practical anatomy; 5) sustain a satisfactory and honorable examination in every department; 6) three terms of clinical and hospital instruction; 7) completion of practical courses in physiology, pathology and demonstrations in surgery.

**FEES:** Matriculation, \$5; lectures, \$50; demonstrator, \$10; analytical chemistry, \$10; microscopy, demonstrations in surgery, each \$5; examination, \$30; scholarships, \$125; single tickets, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	127	51	40
1881-82	113	38	33
1882-83	147	52	35
1883-84	159	50	31
1884-85	143	37	25.8
1885-86	122	50	40.9
1886-87	125	43	34.4
1887-88	116	37	31.9
1888-89	97	36	37.1
1889-90	101	30	29.7

Percentage of graduates to matriculates for past ten years, 33.9.

## CHICAGO NORTHWESTERN COLLEGE.

CHICAGO, ILL.

INCORPORATED 1862. Re-chartered in 1864, and in 1870 became the Edinburg University. Fraudulent.—Extinct.

## EDINBURG UNIVERSITY OF CHICAGO AND ST. LOUIS.

CHICAGO, ILL.

INCORPORATED September 23, 1870. Fraudulent; exposed by the ILLINOIS STATE BOARD OF HEALTH, and since defunct. Also incorporated under the laws of Missouri.

\*See list of Polyclinics and Post-Graduate Schools.



## WOMAN'S MEDICAL COLLEGE OF CHICAGO.

CHICAGO, ILL. MARIE J. MERGLER, M. D., Secretary, 29 Waverly place.

ORGANIZED in 1870. The first class graduated in 1871. No class was graduated in 1872. Classes have been graduated each subsequent year.

The faculty consists of seventeen professors, two clinical professors, one adjunct professor, and six lecturers and assistants.

**COURSE OF INSTRUCTION:** The session of 1890-91, began September 3, 1890, and ends March 31, 1891. A graded course of three years required. Instruction is given by didactic lectures, recitations, clinical lectures, practical work, and attendance on hospitals.

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, medical jurisprudence, hygiene, ophthalmology and otology, diseases of women and children, diseases of the throat and chest, renal diseases, diseases of the nervous system, histology, dental surgery, dermatology, microscopy.

**REQUIREMENTS:** For admission—"Students must present, before matriculating, satisfactory proof of a good English education. A certificate of graduation from high school, academy or college, or a teacher's certificate from a county superintendent of schools, will be accepted as sufficient evidence of such education. Students without such credentials will, in every case, be required to pass an examination before a committee of the faculty. Certificates of character are required."

For graduation: 1) twenty-one years of age; 2) four years' study; 3) two full courses of lectures, one of which must have been in this college; 4) two courses in practical anatomy; 5) one course in practical chemistry, and one course in histological and pathological laboratory; 6) one course in hospital clinical instruction; 7) a satisfactory examination.

**After the session of 1890-91, four years of study and attendance upon three regular courses of lectures will be required as conditions of graduation.**

**FEES:** Matriculation, \$5; lectures, \$60; demonstrator, \$10; chemical laboratory ticket, \$5; chemicals at cost; microscopical laboratory, \$5; hospital tickets, \$5 each; final examination, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	77	17	22
1881-82	82	23	28
1882-83	79	18	22
1883-84	69	21	30.4
1884-85	75	22	29.3
1885-86	76	19	25
1886-87	71	25	35.5
1887-88	68	16	20.5
1888-89	88	24	27.2
1889-90	105*	25	23.8

Percentage of graduates to matriculates for past ten years, 26.5.

## CHICAGO HOMEOPATHIC MEDICAL COLLEGE.

CHICAGO, ILL. J. R. KIPPAX, M. D., Secretary, 3154 Indiana avenue.

ORGANIZED in 1876. The first class was graduated in 1877. Classes have been graduated each subsequent year.

The faculty consists of sixteen professors, seven adjunct professors, two lecturers and two demonstrators.

**COURSE OF INSTRUCTION:** A regular session of six months' duration, commencing September 23, 1890, and ending March 24, 1891. **Three years graded course required of all matriculates who have not previously attended a course of lectures.** A junior, middle and senior course (three separate and distinct courses) are delivered during each college term. Clinics at hospital and dispensary.

Lectures embrace: Junior year—Anatomy, physiology, microscopy, materia medica, chemistry, toxicology, pathology, histology, laboratory work. Middle year—Descriptive anatomy, physiology, medical chemistry, toxicology and urinalysis, hygiene and sanitary science, obstetrics, practice of medicine and surgery, dental surgery, materia medica and clinics. Senior year—Principles and practice of medicine and surgery, pedology, gynecology, obstetrics, ophthalmology and otology, mental and nervous diseases, medical jurisprudence, laryngology, materia medica and clinics.

\*Not including five others taking but partial courses.

**REQUIREMENTS:** For admission: "A credible certificate of good moral character, a diploma of graduation from a good literary or scientific college or high school, or a first-grade teacher's certificate. Or, lacking this \* a thorough examination in the branches of a good English education (including mathematics, English composition and elementary physics, or natural philosophy), before the examining board of the faculty."

**After the session of 1891-92 the matriculation examination will include elementary chemistry, biology and botany, and sufficient Latin to read easy prose.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) **three full courses of lectures**; 5) practical anatomy to the extent of having dissected at least two parts; 6) pass all the regular examinations.

**After the session of 1890-91 four years of study will be required for graduation.**

**FEES:** Matriculation, \$5; lectures, \$65; perpetual ticket, \$150; final examination, \$25; partial course, each chair, \$10; demonstrator's tickets, \$10; hospital, \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	87	25	28.7
1881-82	128	38	29.6
1882-83	125	40	32
1883-84	134	39	29.1
1884-85	125	22	17.6
1885-86	130	52	40
1886-87	126	45	35.7
1887-88	118	47	39.8
1888-89	110	54	49+
1889-90	112*	34	30.3

Percentage of graduates to matriculates for past ten years, 33.1.

**For requirements of the American Institute of Homœopathy in regard to admission in 1892, see Introductory Remarks.**

## COLLEGE OF PHYSICIANS AND SURGEONS OF CHICAGO.

CHICAGO, ILL. JOHN E. HARPER, M. D., Corresponding Secretary, 163 State street.

**ORGANIZED** in 1882. The first class was graduated in 1883. The faculty consists of twenty-four professors, two assistants to professors, one demonstrator of anatomy, one of chemistry, one of pathology, one of microscopy.

**COURSE OF INSTRUCTION:** The regular session of 1890-91 commenced September 23, 1890, and continues six months, closing March 24, 1891. **A graded course of three years required.** Instruction will be given by didactic lectures, clinical teaching, quizzes, recitations and practical work in subjects involving manipulation or the use of instruments and appliances. The spring session will begin March 31, and continue until May 13, 1891. All students are earnestly urged to attend; especial attention is given to the elementary branches, during this session.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, histology, microscopy, dermatology, genito-urinary diseases, dental surgery, orthopedics, ophthalmology and otology, diseases of children, nervous and mental diseases, laboratory work in chemistry, demonstrations of surgery, laryngology and rhinology.

**REQUIREMENTS:** For admission: 1) a creditable certificate of good moral character; 2) diploma of graduation from a good literary and scientific college or high school, or a satisfactory county or State teacher's certificate, or, lacking this, he will be required, 3) to pass a thorough examination in the branches of a good English education, before a member of the faculty, 4) written evidence of the time he has been studying medicine.

For graduation: 1) good moral character; 2) attainment of twenty-one years of age; 3) three full years' study of medicine under the direction of a recognized physician or medical college; 4) **attendance upon three full winter courses of lectures** in a recognized medical college, the last of which must have been in this college; 5) dissection during two sessions, including dissections of each part of the cadaver; 6) attendance upon two terms of college, hospital, and dispensary clinical instruction; 7) satisfactory examinations.

\*Not including two students who matriculated, but took partial courses only.

**FEES:** Matriculation (paid annually), \$5; lectures first and second years, each year, \$60; third year, \$30; demonstrator \$10; chemical laboratory, \$5; microscopical laboratory, \$3; final examinations, \$30; Cook County Hospital, compulsory, \$5; eye and ear infirmary, \$5; partial course, each chair, \$10; lectures, spring course, \$15, applicable to fees for winter lectures.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	152	52	34.2
1883-84	167	52	31.1
1884-85	167	60	35.9
1885-86	151	71	47+
1886-87	143	50	35
1887-88	154	46	29.8
1888-89	155	50	32.2
1889-90	142*	57	40.1

Percentage of graduates to matriculates for past eight years, 35.5.

### CHADDOCK SCHOOL OF MEDICINE.

QUINCY, ILL. R. J. CHRISTIE, M. D., Dean.

ORGANIZED in 1882 as the Quincy College of Medicine. Reorganized in 1888 under above title. Extinct in 1890.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	6	0	—
1883-84	12	4	33.3
1884-85	19	4	21
1885-86	15	7	46.6
1886-87	14	3	21.4
1887-88	14	4	28.5
1888-89	10	4	40
1889-90	13	4	30.7

Percentage of graduates to matriculates for past eight years, 29.1.

### PHYSIO-MEDICAL INSTITUTE.

CHICAGO, ILL. H. P. NELSON, M. D., Secretary, 605 W. Van Buren street.

ORGANIZED in 1885. The faculty consists of ten professors and two lecturers.

**COURSE OF INSTRUCTION:** The session of 1890-91 began September 18, 1890, and will continue twenty-six weeks.

Lectures embrace anatomy and physiology, materia medica, chemistry and toxicology, science and practice of medicine, surgery, obstetrics, gynecology, diseases of children, hygiene, medical jurisprudence, ophthalmology and otology, insanity and nervous diseases, dermatology, therapeutics, pharmacy, microscopy and pathology.

**REQUIREMENTS:** For admission: "Students must, either by high school certificate or suitable examination, give evidence of having a good English education; furnish satisfactory evidence of proper preparation and of good moral character. \* Attendance must begin with the opening of the lecture term, and be punctual throughout. \* Women admitted upon the same terms as men."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three full terms** of lectures the last of which must be in this college; two full terms of hospital attendance, and dissection of at least two parts of the human body; 4) punctual attendance on all college lectures, graduates' quizzes; 5) satisfactory written examination in all departments of instruction.

**After the session of 1890-91 four years of study will be required.**

**FEES:** Matriculation, \$5; lecture fees, \$65; demonstrator's ticket, \$10; hospital ticket, \$5; graduates' examination, \$35.

---

\* Not including six graduates who matriculated.

STUDENTS; Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1885-86	18	10	55.5
1886-87	20	8	40
1887-88	15	7	46.6
1888-89	21	10	49.6
1889-90	15	5	33.3

Percentage of graduates to matriculates for the past five years, 44.9.

Names of matriculates and graduates not published in announcements.

#### CHICAGO CORRESPONDENCE UNIVERSITY.

INCORPORATED in 1885; re-incorporated in 1887. Extinct 1890. This and the following institution were incorporated by the same person.

#### THE NATIONAL UNIVERSITY.

CHICAGO, Ill.

INCORPORATED July 25, 1889. Extinct 1890.

The above named institutions practically have had no existence as teaching bodies, for purposes of medical instruction.

#### CHICAGO COLLEGE OF SCIENCE.

CHICAGO AND CHICAGO LAWN, Ill.

INCORPORATED July 5, 1888.—Extinct 1889.

The attention of the BOARD was called to this institution by Prof Flint, of the Bellevue Hospital Medical College of New York City, on account of one of its diplomas being offered for registration in the State of New York. The claims of the college were investigated, and upon reporting that the institution had no existence in fact, diploma was refused endorsement for registration.

Diplomas of this character are not now offered in Illinois.

These last three so-called institutions were incorporated under the general laws of incorporation of the State of Illinois.

By compliance with certain forms, and payment of six dollars in fees, anything can be incorporated.

### INDIANA.

#### UNIVERSITY OF INDIANA.

NEW ALBANY, Ind.

ORGANIZED in 1833. The first fraudulent medical school in the west.—Extinct.

#### LA PORTE UNIVERSITY, MEDICAL DEPARTMENT.

LA PORTE, Ind.

ORGANIZED in 1843. Reorganized in 1844; lectures delivered in 1844-45. In 1845-46 it was again reorganized, under the name of the Indiana Medical College; reorganized again in 1847-48; extinct in 1849.

#### MEDICAL COLLEGE OF EVANSVILLE.

EVANSVILLE, Ind.

ORGANIZED in 1849. Lectures suspended from 1864 to 1871. Reorganized in 1871, and classes were graduated from 1873 to 1884, inclusive, when the college suspended.

## INDIANA CENTRAL MEDICAL COLLEGE.

*(Medical Department. Asbury University, Greencastle. Ind.)*

INDIANAPOLIS, Ind.

ORGANIZED in 1850.—Extinct in 1854.

## PHYSIO-MEDICAL COLLEGE OF INDIANA.

INDIANAPOLIS, Ind. C. T. BEDFORD, M. D., Secretary, 290 Massachusetts avenue.

ORGANIZED in 1873. The first class was graduated in 1874. Classes have been graduated each subsequent year.

The faculty consists of fourteen professors and four demonstrators.

COURSE OF INSTRUCTION: The session of 1890-91 began September 16, 1890, and will continue twenty-four weeks, closing March 17, 1891. Women admitted upon the same terms as men.

Lectures embrace practice of medicine and clinical medicine, surgery, obstetrics, gynecology, diseases of children, materia medica and therapeutics, botany, electro-therapeutics, histology and physiology, general and descriptive anatomy, surgical anatomy, microscopy and pathological histology, chemistry and toxicology, medical jurisprudence, diseases of rectum, diseases of the eye, ear and throat, sanitary science, and diseases of nervous system.

REQUIREMENTS: For admission: "A diploma or certificate from a university, college or academy, or a certificate from a board of school examiners, will be taken, in part, as evidence of the required literary qualification. In lieu of any of these, applicants must sustain a satisfactory examination by a member of the faculty before being permitted to enter the class."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) must have attended three or more full courses of lectures not delivered in the same twelve months, the last of which must have been in this school; 4) must have attended hospital clinics and received clinical instruction during three college terms; 5) must have dissected each region of the body; 6) must have at least two courses in practical chemistry. Every candidate must undergo a full and satisfactory written examination, on each branch taught in the college, and remain to the close of the course.

**"Beginning with session of 1890-91 four years of study and four graded terms of six months each, given in four consecutive years are required."**

FEES: Matriculation, (paid but once), \$5; hospital, \$3; lectures, \$75; demonstrator, \$10; graduation, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	20	10	50
1881-82	24	10	41.6
1882-83	26	17	64
1883-84	21	7	33.3
1884-85	34	12	35.3
1885-86	30	18	60
1886-87	21	7	33.3
1887-88	26	10	38.4
1888-89	36	20	55.5
1889-90	36	16	44.4

Percentage of graduates to matriculates for past ten years, 46.3.

**Diplomas recognized conditionally.**

## MEDICAL COLLEGE OF FORT WAYNE.

FORT WAYNE, Ind.

ORGANIZED in 1876. Classes were graduated in each year from 1877 to 1883, inclusive.—Extinct, 1883.

## THE MEDICAL COLLEGE OF INDIANA.

INDIANAPOLIS, IND. FRANKLIN W. HAYS, M. D., Secretary, 19 E. Ohio street.

ORGANIZED in 1878, when the Indiana Medical College (organized in 1868) and the College of Physicians and Surgeons of Indiana (organized in 1873) were united to form this college. It was formerly the Medical Department of Butler University, but severed its connection with that institution in 1883. Organized in 1890 as The Medical College of Indiana, in conformity with terms of the donation made by Dr. William Lomax, of Marion, Indiana.

The faculty consists of fifteen professors, two clinical lecturers, six lecturers, two assistants to chairs, one curator; one demonstrator and one assistant demonstrator.

**COURSE OF INSTRUCTION:** The session of 1890-91 began October 1, 1890, and will close March 31, 1891. Three years graded course of six months each is required.

The system of study will be as is presented in the following general outline: First year—Anatomy with dissections, materia medica, principles of surgery, general pathology, physiology and hygiene, chemistry with laboratory work, microscopy, clinical studies. Second year—Anatomy with dissections, chemistry and toxicology, physiology, principles of surgery, general pathology, materia medica and therapeutics, ophthalmology, dermatology, microscopy and bacteriology, syphilis, gynecology, practice of surgery, practice of medicine, diseases of children, obstetrics, clinical studies, laboratory work. Third year—Surgery, practice of medicine, obstetrics, diseases of children, gynecology, materia medica and therapeutics, diseases of the mind and nervous system, medical jurisprudence, ophthalmology and otology, dermatology, laryngology, genito-urinary and venereal diseases, dissections, microscopy and bacteriology, clinical studies, advanced work in physiological, pathological, microscopical, and chemical laboratories.

These courses are so arranged that they do not in any way conflict with one another.

**REQUIREMENTS:** For admission: 1) candidates, before commencing the first year of study, must present to the faculty a credible certificate of good moral standing; 2) diploma of graduation from a good literary or scientific college, or high school, or state or county teacher's certificate. Or, lacking this, 3) a thorough examination in the branches of a good English education, including mathematics, English composition, and elementary physics or natural philosophy.

\*For graduation: "He must produce satisfactory evidence of good moral character, and of having attained the age of twenty-one years. He must file a satisfactory certificate of having studied medicine for at least **four years** under a regular graduate, or a licentiate and practitioner of medicine in good standing, using the word 'regular' in the sense commonly understood in the medical profession. No candidate shall be eligible for final examination for graduation unless his term of **four years'** study shall have been completed, or shall expire at a date not later than three months after the close of the final examination. He must file the proper official evidence that during the above-mentioned **four years** has matriculated at some affiliated college or colleges for **three** regular sessions, and in the course of the same has attended **three full courses of instruction of six months each**. The candidate must have passed a personal examination before the faculty in the seven essential branches of medicine."

**FEES:** Matriculation, \$5; laboratory, \$5; lectures, \$40; demonstrator \$16; hospital \$6; graduation, \$25; single tickets, each chair, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	200	83	41.5
1881-82	164	58	35+
1882-83	131	53	40.4
1883-84	71	43	60.5
1884-85	60	28	46.6
1885-86	66	27	40.9
1886-87	65	35	53.8
1887-88	66	26	39.3
1888-89	68	27	39.7
1889-90	81	30	37+

Percentage of graduates to matriculates for past ten years, 42.1.

\*Students or practitioners who have attended one full course of instruction, in this or any other reputable medical college, where a two years' course up to this time, or a previous time, has been required for graduation, will be privileged to become candidates for graduation for this year only.

## CENTRAL COLLEGE OF PHYSICIANS AND SURGEONS.

INDIANAPOLIS, Ind. SAMUEL E. EARP, M. Sc., M. D., Secretary, 24½ Kentucky avenue.

ORGANIZED in 1879. First class graduated in 1880.

The faculty consists of thirteen professors, one adjunct professor, three assistants, two demonstrators.

**COURSE OF INSTRUCTION:** The regular winter session of 1890-91 commenced September 17, 1890, and continues to March 20, 1891. A three years' graded course is recommended but not required. Clinical instruction at college and hospital. Women admitted on the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, diseases of children, sanitary science, medical jurisprudence, ophthalmology, otology, laryngology, rhinology, histology and diseases of the nervous system, clinical medicine and surgery, and genito-urinary diseases, orthopedics and railroad surgery.

**REQUIREMENTS:** For admission: 1) credible certificate of good moral character; 2) diploma of graduation from a good literary and scientific college, or high school, or a first-grade teacher's certificate; or, lacking this, a thorough examination in the branches of a good English education, including mathematic, English composition, and elementary physics or natural philosophy.

For graduation 1) good moral character; 2) twenty-one years of age; 3) three years' study; 4) two full courses of lectures; 5) must have pursued the study of practical anatomy, under the guidance of a demonstrator, making dissections of at least three regions.

**After the session of 1890-91, this institution will require four years of study of medicine, and attendance on three courses of lectures of six months each.**

**FEES:** Matriculation, \$5; lectures, \$40; laboratory, \$5; demonstrator, \$10; hospital, compulsory, \$6; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	62	17	27.4
1881-82	43	10	23.2
1882-83	44	24	54.5
1883-84	28	13	46.4
1884-85	25	11	44
1885-86	20	12	60
1886-87	16	4	25
1887-88	16	5	31.2
1888-89	21	7	33.3
1889-90	27	7	25.9

Percentage of graduates to matriculates for past ten years, 36.4.

## FORT WAYNE COLLEGE OF MEDICINE.

(Medical Department of the Taylor University.)

FORT WAYNE, Ind. C. B. STEMEN, M. D., Dean, 74 Calhoun street.

ORGANIZED 1879. United with Taylor University, 1890. The first class was graduated in 1880.

The faculty consists of thirteen professors and one lecturer.

**COURSE OF INSTRUCTION:** The collegiate year of 1890-91 began September 9, 1890 and closes March 9, 1891. **A three years' graded course is obligatory.** Instruction consists of didactic lectures, clinical teaching, recitations and practical work in laboratories. Clinics at hospital and college. Women admitted upon the same terms as men.

The new curriculum of study is—For the first year—Anatomy and dissections, physiology, general and medical chemistry, practical chemistry in laboratory, materia medica and pharmacy, hygiene and state medicine, clinics in college, hospitals and dispensary. For the second year—Descriptive anatomy and dissections, surgical anatomy, histology and microscopy, materia medica and therapeutics, practice of medicine and physical diagnosis, surgery and minor surgery, obstetrics and gynecology, pediatrics, dermatology, clinics. For the third year—Practice of medicine and clinical medicine, surgery and operative and clinical surgery, clinical obstetrics, pediatrics and gynecology, pathology, medical jurisprudence, ophthalmology, otology, rhinology, laryngology and neurology. Each member of the graduating class will have opportunity of attending at least one case of confinement during the session.

**REQUIREMENTS:** For admission: "Each student must present satisfactory evidence by examination or otherwise, of proficiency in the fundamental branches of an English education. Graduation from a college, academy or high school, or a license to teach in the public schools, will be evidence of such proficiency."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **must have studied medicine four years;** 4) studied **three winter terms** in a medical college, the last term being in this institution; 5) dissection for two sessions; 6) instruction in chemistry and histology during two sessions; 7) must have followed the practice of a hospital; 8) must pass monthly and terminal examinations. "Students who have matriculated in this or any other recognized college previous to September, 1890, may graduate on two full courses."

**FEES:** Matriculation, \$5; lectures, \$40; demonstrator, \$5; laboratory, \$5; hospital, \$5; graduation, \$25; single tickets, each chair, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	27	16	59.2
1882-83	25	12	48
1883-84	23	10	43.5
1884-85	21	5	23.8
1885-86	22	11	50
1886-87	19	6	31.5
1887-88	23	12	52
1888-89	18	9	50
1889-90	31	7	22.5

Percentage of graduates to matriculates for past nine years, 42.1.

Names of matriculates not given in the announcement.

### INDIANA ECLECTIC MEDICAL COLLEGE.

INDIANAPOLIS, Ind. W. P. ADKINSON, B. S., M. D., Secretary, 115½ Washington street.

**ORGANIZED** in 1880. The faculty consists of nine professors, one demonstrator, one lecturer.

**COURSE OF INSTRUCTION:** The regular session of 1890-91 began October 1, 1890, and will continue twenty weeks, ending March 21, 1891. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica, therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, ophthalmology, otology, electro-therapeutics, diseases of children, diseases of the nervous system and biology.

**REQUIREMENTS:** For admission: "Every student must show credible certificates of good moral character, and must possess a diploma of graduation from a good literary and scientific college or high school, or a first-grade teacher's certificate; or lacking this, a thorough written examination in the branches of a good English education, including mathematics, English composition and elementary physics or natural philosophy."

For graduation: 1) twenty-one years of age; 2) three years' study, preceding time of graduation; 3) two full courses of lectures; 4) must produce evidence of attendance on lectures on practical anatomy; 5) thesis or clinical report; 6) examination on the regular and essential branches of medicine; 7) good moral character.

**FREE:** Matriculation, \$5; demonstrator, \$10; lectures, \$50; graduation, \$25; laboratory, \$5; hospital, \$3; scholarships, \$120.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	27	12	44.4
1881-82	19	11	57.8
1882-83	24	7	29.1
1883-84	31	10	32.2
1884-85	19	8	42.1
1885-86	37	22	59.4
1886-87	19	10	52.6
1887-88	22	10	45.4
1888-89	21	8	38+
1889-90	49	15	30.6

Percentage of graduates to matriculates for past ten years, 42.1.

**After the session of 1890-91 three courses of lectures and four years' study will be required.**

**Diplomas not recognized.**



## CURTIS PHYSIO-MEDICAL INSTITUTE.

MARION, Ind.

ORGANIZED in 1881 under a general act of the State Legislature passed in 1885. Extinct, 1890.

**Diplomas not recognized.**

## HOSPITAL MEDICAL COLLEGE OF EVANSVILLE.

EVANSVILLE, Ind.

ORGANIZED in 1882.—Extinct in 1886.

## BEACH MEDICAL COLLEGE.

INDIANAPOLIS, Ind.

ORGANIZED in 1883. Merged into the Indiana Eclectic Medical College in 1884.

## BEACH MEDICAL INSTITUTE.

INDIANAPOLIS, Ind.

Merged into the Indiana Eclectic Medical College at the close of the session of 1885-86. The institution graduated one class in 1885.

## ECLECTIC COLLEGE OF PHYSICIANS AND SURGEONS.

INDIANAPOLIS, Ind. HENRY LONG, M. D., East Ohio street.

ORGANIZED in 1890.

The faculty consists of eleven professors, one assistant and one demonstrator. Women admitted on the same terms as men.

**COURSE OF INSTRUCTION:** The first session began October 1, 1890.

Lectures embrace anatomy, physiology, chemistry, materia medica, practice of medicine, surgery, obstetrics, diseases of women and children, medical jurisprudence, hygiene, diseases of the eye and ear and electro-therapeutics.

**REQUIREMENTS:** For admission: 1) good moral character; 2) diploma from a good literary and scientific college, high school, or a first grade teacher's certificate, or lacking this, a thorough written examination in the branches of a good English education, including mathematics, English composition and elementary physics or natural philosophy.

For graduation: 1) twenty-one years of age; 2) must have read medicine three years preceding time of graduation; 3) two courses of lectures, satisfactory examinations; 4) thesis; 5) certificate of attendance of lectures on practical anatomy.

**All who matriculate in this College after the session of 1890-91 will be required to study four years and attend three courses of lectures.**

**FEES:** Matriculation, \$5; demonstrator, \$10; lectures, \$40; graduation, \$25; laboratory, \$5; hospital, \$3; scholarships, \$60.

## IOWA.

## STATE BOARD OF MEDICAL EXAMINERS.

J. F. KENNEDY, M. D., Secretary, Des Moines, Iowa.

As will be seen by reading the "Act to Regulate the Practice of Medicine and Surgery," in the State of Iowa, the physicians of the State Board of Health and its Secretary are made the State Board of Medical Examiners. Their duties are entirely independent of the State Board of Health. By this Act, which went into effect April 9, 1886, every person practicing medicine, surgery or obstetrics within the state is required to have a certificate from the State Board of Medical Examiners. These certificates are of three classes: 1st. For graduates in medicine; 2d. For persons who have been in continuous practice within the state five years, three of which have been in one locality; 3d. For those who shall have passed an examination before the Board of Examiners, or before any other State Board of Medical Examiners. The Board requires not less than 80% of correct answers to all questions.

## SCHEDULE OF MINIMUM REQUIREMENTS OF ALL MEDICAL COLLEGES.

## ADOPTED BY THE IOWA STATE BOARD OF MEDICAL EXAMINERS.

I. CONDITIONS OF ADMISSION TO LECTURE COURSE.—1. Credible certificates of good moral character. 2. Diplomas of graduation from a recognized college, scientific or high school, or lacking this, a thorough examination in the branches of a good English education, including mathematics, English composition and elementary physics, or natural philosophy.

II. BRANCHES OF MEDICAL SCIENCE TO BE INCLUDED IN THE COURSE.—1. Anatomy; 2. Physiology and hygiene; 2. Chemistry; 4. Materia medica and therapeutics; 5. Theory and practice of medicine; 6. Pathology and pathological anatomy; 7. Surgery; 8. Obstetrics.

III. LENGTH OF REGULAR GRADUATING COURSES.—1. The time occupied in each regular course of medical lectures shall not be less than six months, or twenty-four weeks each. 2. **Three full courses of lectures, not more than one of which shall be within the same year of time, shall be required for graduation with the Degree of Doctor of Medicine.**

IV. ATTENDANCE AND EXAMINATION, OR QUIZZES.—1. Regular attendance during the entire lecture courses, shall be required, allowance being made only for absence occasioned by the student's sickness, and such absence not to exceed twenty per centum of the course. 2. Regular examination or quizzes to be made by each lecturer or professor, daily or at least once each week. 3. Final examination in all branches, to be conducted, when practicable, by competent examiners, other than the professors in each branch.

V. DISSECTION, CLINICS AND HOSPITAL ATTENDANCE.—1. Each student shall have dissected during at least two courses. 2. Attendance during at least two terms of clinical and hospital instruction shall be required.

VI. TIME OF PROFESSIONAL STUDIES. 1. **After the session of 1890-91 this shall not be less than four years before graduation, including the time spent with a preceptor and attendance upon lectures, as stated above. (III)**

VII. INSTRUCTION.—1. The college must show that it has a sufficient and competent corps of instructors, and the necessary facilities for teaching dissections, clinics, etc.

VIII. GRADUATES TO MATRICULATES.—1. The aggregate graduates of a college shall not exceed forty-five per cent. of its aggregate matriculates during the period of five years ending with any session subsequent to the session of 1885-6.

The laws of Iowa and Illinois being almost identical, the rules, regulations and forms adopted by the former are similar to those of the ILLINOIS BOARD.

Under the Pharmacy law of Iowa, itinerants, specialists and vendors of drugs, nostrums or anything to treat diseases, or who profess to cure any disease, are required, in addition to the certificate to practice, to pay a license fee of one hundred dollars per year.

The Board issued 3,735 certificates; this includes those receiving certificates on diplomas, on length of practice, on examination, and 28 to midwives. To date of November 27, 1890, 2,765 were issued to Physicians; 428 to Homeopaths; 406 to Eclectics, and 108 to miscellaneous schools. The law permits all women who have been engaged in the practice of midwifery for one year prior to its enactment, to continue such practice without certificate. The persons to whom certificates to practice midwifery were issued, presented diplomas showing graduation in midwifery, or examination before a State Board of Medical Examiners, legally constituted as such. The law was so amended by the last legislature as to permit the Board to issue certificates to those furnishing satisfactory evidence of having passed a satisfactory examination before other state boards with similar Medical Practice Acts.

## COLLEGE OF PHYSICIANS AND SURGEONS.

KEOKUK, IOWA. J. C. HUGHES, M. D., Dean.

ORGANIZED in 1850: four years after it became the Medical Department of the University of Iowa, and upon the organization of the Medical Department of the State University of Iowa, at Iowa City, in 1870, the original name was assumed.

The faculty consists of thirteen professors, two lecturers, and one demonstrator of anatomy.

**COURSE OF INSTRUCTION:** The regular annual session of 1889-90 commenced September 24th, 1890, and continues twenty-four weeks. A three-years' graded course recommended, but not required. Clinics at college infirmary; daily quizzes conducted by the faculty. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica, therapeutics, theory and practice of medicine and clinical medicine, pathology, principles and practice of surgery and clinical surgery, obstetrics and gynecology, public hygiene and state medicine, medical jurisprudence, toxicology, ophthalmology, otology, histology, diseases of the nervous system, diseases of children, laryngology, and physical diagnosis.

**REQUIREMENTS:** For admission: "A diploma of graduation from a good literary or scientific college or high school, or a satisfactory county or state teacher's certificate. Lacking this, they will be required to pass an examination in the branches of a good English education."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) three years' study; 5) no thesis required; 6) satisfactory examination, either oral or written at the discretion of the faculty, in anatomy, physiology, pathology, chemistry, materia medica, therapeutics, obstetrics, practice of medicine, surgery and hygiene; 7) must have dissected during two courses.

**After the session of 1890-91, three full courses of lectures will be required.**

**FEES:** Matriculation, \$5; demonstrator, \$5; lectures, \$20; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1879-80	266	117	43.9
1881-82	273	126	46.1
1882-83	130	54	41.5
1883-84	121	59	48.7
1884-85	93	40	43
1885-86	90	34	37.7
1886-87	132	57	43.1
1887-88	120	51	42.5
1888-89	113	33	29.2
1889-90	169	63	37.2

Percentage of graduates to matriculates for ten years, reported 42+.

## IOWA MEDICAL COLLEGE.

KEOKUK, IOWA.

ORGANIZED in 1858.—Extinct since 1860.

## MEDICAL DEPARTMENT, STATE UNIVERSITY OF IOWA.

IOWA CITY, Ia. LAWRENCE W. LITTEG, M. D., Secretary of the Medical Faculty.

ORGANIZED in 1870. First class was graduated in 1871. Classes have been graduated each subsequent year.

The faculty consists of seven professors, one demonstrator, three lecturers, and one prospector.

**COURSE OF INSTRUCTION:** The annual graduating session of 1890-91 began September 10, 1890, and continuing six months, closes in March, 1891. "For the purpose of increasing the facilities for medical instruction, the Board of Regents has decided to extend the course to six months, and to require attendance on **three annual sessions.**" There is also always appointed by the Board an examining committee from the membership of the State Medical Society, who direct and take part in the examination of all applicants for graduation. Women admitted upon the same terms as men. Daily quizzes; clinics at Hospital. Recitations, practical work in laboratory, didactic and clinical lectures constitute the mode of instruction. All students in the advanced classes will receive special practical instruction in physical diagnosis, mechanical obstetrics, application of splints, bandages and surgical dressing.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, histology, hygiene, medical jurisprudence, insanity, toxicology, ophthalmology, otology, dentistry and rhinology.

**REQUIREMENTS:** For admission—"All candidates for admission to the course of medical lectures must give evidence of a good English education. If the applicant is a graduate of a literary or scientific college, or presents the certificate of having passed the entrance examination of such an institution, or the certificate of graduation from a high school or academy, it will be accepted in lieu of an examination. In any other case, the candidate must pass an examination before a committee of the faculty, as follows: A written composition, not to exceed a page of foolscap, on a given subject, which will be the test of orthography, grammar, etc.; an examination in common arithmetic, history of the United States, in geography and elementary physics, or natural philosophy. Students from other schools not requiring preliminary examinations must present credentials, or be examined for admission."

▲ For graduation: 1) twenty-one years of age; 2) unexceptionable moral character; 3) three years' study; 4) **three courses of lectures**; 5) satisfactory examination in all the branches taught; 6) must have completed two courses in practical anatomy.

**Four years of study will be required after the session of 1890-91.**

**FEES:** Matriculation, \$5; lectures, \$20; demonstrator, \$10; final examinations, \$25; hospital, \$3.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates,	Graduates.	Percent.
1880-81	149	35	23.4
1881-82	151	46	30.4
1882-83	162	35	21+
1883-84	142	37	26+
1884-85	116	43	36.1
1885-86	99	35	35.3
1886-87	120	42	35
1887-88	109	37	33.9
1888-89	122	42	34.4
1889-90	123	24	19.5

Percentage of graduates to matriculates for past ten years, 29+.

## HOMEOPATHIC MEDICAL DEPARTMENT, STATE UNIVERSITY OF IOWA.

IOWA CITY, Ia. A. C. COWPERTHWAIT, M. D., Dean of the Faculty.

**ORGANIZED** in 1877. The first class was graduated in 1878; classes have been graduated each subsequent year.

The faculty consists of four professors, two assistant professors, one lecturer and one curator. The teaching of this department is supplementary, the peculiar views of the school only being taught. The lectures on subjects common to both schools are delivered by the professors in the other department.

**COURSE OF INSTRUCTION:** Instruction graded, extending over a period of three years. The annual session of 1890-91 commenced September 10, 1890, and closes March 10, 1891. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica, and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, toxicology, ophthalmology and otology, dermatology, insanity, diseases of children, sanitary science.

**REQUIREMENTS:** For admission—same as in the other medical department.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) **three courses of lectures**, of at least six months, each; 5) must have been engaged for at least two courses, in the study of practical anatomy; 6) satisfactory examination in all the branches taught in the department. "The final examinations will be conducted in writing, by the faculty of the department, subject to rejection or approval of a board of examiners, selected for that purpose from the homeopathic physicians of Iowa. The *ad eundem* degrees in this department may be conferred under the following circumstances: The candidate must be in possession of an accredited diploma, and must present letters from two respectable physicians in regard to his moral character and professional standing. An attendance upon lectures from time to time during the session, and a satisfactory examination must be passed on all subjects taught in the department."

**FEES:** Matriculation, \$5; lectures, \$20; demonstrator, \$10; graduation, \$25; hospital, \$3.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	60	16	26.6
1881-82	46	15	32.6
1882-83	44	12	27.2
1883-84	35	12	34.2
1884-85	33	10	30.3
1885-86	29	10	34.4
1886-87	35	14	40
1887-88	32	13	40.6
1888-89	29	9	31+
1889-90	32*	10	31.2

Percentage of graduates to matriculates for past ten years, 32.2.

**For requirements of the American Institute of Homeopathy in regard to admission and graduation in 1892, see Introductory Remarks.**

### IOWA MEDICAL COLLEGE—ECLECTIC.

DES MOINES, Ia.

ORGANIZED in 1881 as the Iowa Eclectic Medical College, Medical Department of Drake University; assumed its present name in 1883. The first class was graduated in 1882. Extinct in 1887.

### IOWA COLLEGE OF PHYSICIANS AND SURGEONS.

(Medical Department of Drake University.)

DES MOINES, Ia. LEWIS SCHOOLER, M. D., Dean, 521 Walnut street.

ORGANIZED in 1882. The first class was graduated in 1883.

The faculty consists of thirteen professors, one adjunct professor, one lecturer and one demonstrator.

**COURSE OF INSTRUCTION:** The ninth annual session commenced October 7, 1890, and closes March 13, 1891. **A three years' graded course required.** Clinics at hospital and dispensary. Women admitted upon same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, toxicology, histology, ophthalmology, otology, metalogy, diseases of children and orthopedic surgery, laryngology, dermatology and genito-urinary diseases, mental and nervous diseases, botany and pharmacy.

**REQUIREMENTS:** For admission: "Before matriculating each student shall pass a written examination in the common English branches, mathematics and natural sciences, Latin or German, or he shall possess a teacher's certificate or a certificate of graduation from some literary college."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) three full courses of lectures; 5) satisfactory examination in the several branches taught in the college; 6) two courses in practical anatomy.

**FEES:** Matriculation, \$5; lectures, \$20; graduation, \$25; laboratory (compulsory), \$5; dissecting material, \$10.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	8	3	37.5
1883-84	19	8	42.1
1884-85	13	7	53.8
1885-86	18	8	44.4
1886-87	24	8	33.3
1887-88	22	8	36.3
1888-89	20	9	45
1889-90	16	6	37.5

Percentage of graduates to matriculates for past eight years, 40.7.

\*Not including two graduates who matriculated.

## KING ECLECTIC MEDICAL COLLEGE.

DES MOINES, Ia.

ORGANIZED in 1883. The first class was graduated in 1884. Extinct in 1888.

## IOWA ECLECTIC MEDICAL COLLEGE.

DES MOINES, Ia. JOHN COOPER, M. D., Dean.

ORGANIZED in 1887. First class graduated in 1888.

The faculty consists of ten professors and one demonstrator.

**COURSE OF INSTRUCTION:** The fourth annual session began October 6, 1890, and will continue six months. Women admitted on same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology and pathological anatomy, surgery and obstetrics, toxicology, gynecology, hygiene, medical jurisprudence and pharmacy.

**REQUIREMENTS:** For admission: 1) a good moral character; 2) diploma or teacher's certificate; lacking these must undergo an examination in the branches of a good English education.

For graduation: 1) twenty-one years of age and of a good moral character; 2) three years' study and two full courses of lectures; 3) two dissections not in the same term.

**FEES:** Matriculation (once only), \$5; lectures, \$30; demonstrator, \$10; laboratory, \$5; graduation (returnable if applicant fails), \$25; scholarships, \$75.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1887-88	27	12	44.4
1888-89	18	8	44.4
1889-90	29	9	31+

Percentage of graduates to matriculates for past three years, 39.1.

**Note.**—After session of 1890-91 no one will be graduated unless he or she has attended three full terms of six months each, and studied medicine four years.

**Diplomas not recognized.**

## KEOKUK MEDICAL COLLEGE.

KEOKUK, Ia. T. J. MAXWELL, M. D., Secretary, 18 North Fifth street.

ORGANIZED, 1890. The faculty consists of ten professors, one lecturer and one demonstrator.

**COURSE OF INSTRUCTION:** Annual course of lectures began September 24, 1890, and will continue twenty-four weeks; no vacations except upon legal holidays. Didactic lectures, clinics, practical work in the laboratories, and dissecting. Each member of the faculty will devote one hour a week to quizzes. Women admitted on same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, pathology, histology, obstetrics, toxicology, gynecology, diseases of children, hygiene, medical jurisprudence, diseases of the nervous system, ophthalmology, otology and dermatology.

**REQUIREMENTS:** For admission: 1) a diploma from a literary or scientific college, or a teacher's certificate; 2) or an examination by a committee of the faculty in the branches of a good English education, including elementary physics.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of medical lectures; 5) dissection during two courses; 6) satisfactory examination.

**After the session of 1890-91 three full courses will be required.**

**FEES:** Matriculation, \$5; demonstrator, \$5. hospital, \$3; lectures, \$20; graduation, \$30.

**KANSAS.****KANSAS MEDICAL COLLEGE.**

INDEPENDENCE, Kansas.

ORGANIZED in 1872. Was in existence three years and had two graduating classes. Extinct in 1875.

**UNIVERSITY OF KANSAS, PREPARATORY MEDICAL COURSE.**

LAWRENCE, Kan. FRANCIS H. SNOW, Ph. D., President of the University.

ORGANIZED in 1880.

**COURSE OF INSTRUCTION:** Two terms of twenty weeks' duration annually, making a preparatory medical course which is claimed to be "accepted by all the leading colleges of the West as the first of a three years' course, and students passing examinations in these classes will be admitted to the second year in those colleges on the certificate of the faculty of this institution."

First term—Chemistry lectures and recitations daily, for twenty weeks; laboratory practice for twenty weeks; physiology lectures daily, for ten weeks; comparative anatomy, dissections, etc., chemical arithmetic ten weeks. Second term—Botany recitations for ten weeks; physiological chemistry recitations for twenty weeks; toxicology ten weeks; materia medica recitations and lectures twenty weeks.

**REQUIREMENTS:** A full collegiate course is recommended for all professional students. Any student admitted to the special course in medicine must be prepared for at least the freshman class in all English studies.

**FEES:** A contingent fee of \$10 is required for all students. An additional fee of \$25 is required for admission to the preparatory medical course. Deposit for breakage (returnable), laboratory course, \$10-\$15; graduation fee, \$5.

Number of matriculates, 1888-89, three.

**WICHITA MEDICAL COLLEGE.**

WICHITA, Kan. C. G. MCCOLLOUGH, M. D., Secretary, 122 East Douglas avenue.

ORGANIZED in 1889. Suspended.

The faculty consists of sixteen professors, one lecturer and one demonstrator.

**COURSE OF INSTRUCTION:** The second session was opened October 1, 1890 and will continue until March 28, 1891. Instruction comprises didactic lectures, quizzes, recitations, laboratory work and clinics. **Attendance on three sessions obligatory.**

Lectures embrace anatomy, physiology, medical chemistry and toxicology, materia medica, and therapeutics, theory and practice of medicine, physical diagnosis and clinical medicine, histology, pathology, surgery, obstetrics, gynecology, diseases of children, diseases of the mind and nervous system, ophthalmology and otology, orthopedic surgery, hygiene, state medicine, genito-urinary diseases and dermatology.

**REQUIREMENTS:** For admission: a good moral character and evidence of a good English education.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) complete dissection of the body; 4) three years' study; 5) **three full courses of lectures;** 6) satisfactory examination.

**FEES:** Matriculation, \$5; demonstrator, with material, \$10; lectures, \$50; single tickets, each branch, \$10; chemical and histological laboratories, \$10; final examination, \$25.

**STUDENTS:** Number of matriculates, session 1889-1890, was eleven.

**THE KANSAS MEDICAL COLLEGE.**

TOPEKA, Kan. J. E. MINNEY, M. D., Dean, 723 Kansas avenue.

ORGANIZED in 1889.

The faculty consists of twenty-two professors, one lecturer, and one demonstrator.

**COURSE OF INSTRUCTION:** The first regular annual session began September 23, 1890, and will continue twenty-four weeks. "Quizzes, recitations, thorough work in the laboratories and careful dissecting, will be special features of the course." **Attendance on these sessions obligatory.**

Lectures embrace first year, anatomy, chemistry, toxicology, physiology, histology, dissections and laboratory work, materia medica and therapeutics, pathology; second year, anatomy, histology, obstetrics, surgery, theory and practice of medicine, surgical demonstrations, laryngology, rhinology, dental pathology, oral surgery, clinics; third year, gynecology, orthopedics, dermatology, hygiene, genito-urinary and venereal diseases, ophthalmology and otology, diseases of children, of the nerves and mind, clinics, medical jurisprudence.

**REQUIREMENTS :** For admission: Credible certificate of good moral standing; a diploma from a recognized literary or scientific college or high school; or, lacking this, an examination in mathematics, English composition, elementary physics.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) *completion* of three years of study; 3) dissection of the entire human body; 5) **three courses of lectures**, 6) satisfactory examinations.

**FEES:** Matriculation, \$5; general ticket (first and second year) \$60; final examination \$30.

## KENTUCKY.

### THE LAW REGULATING THE PRACTICE OF MEDICINE IN KENTUCKY.

§ 1. *Be it enacted by the General Assembly of the Commonwealth of Kentucky*, That an act, entitled "An act to protect the citizens of this Commonwealth from empiricism," approved February 23, 1874, be so amended as to provide that it shall be the duty of the County Clerk of each county to purchase a book of suitable size, to be known as the "Medical Register" of the county, and to set apart one full page for the registration of each physician; and when any physician shall depart this life or remove from the county, he shall make a note of the same at the bottom of the page; and said Clerk shall (on the first day of January in each year) transmit to the office of the State Board of Health a duly certified list of the physicians of such county, registered under this act, together with such other information as is hereinafter required, and perform such other duties as are required by this act, and such Clerk shall receive the sum of fifty cents from each physician so registered, which shall be his full compensation for all duties required under this act.

§ 2. That on and after the first day of April, 1889, it shall be unlawful for any person to practice medicine in any of its branches within the limits of this State who has not exhibited and registered in the County Clerk's office of the county where he is practicing or intends to commence the practice of medicine his authority for so practicing medicine as prescribed in this act, the name and location of the college issuing the same, if it be a diploma, the date of same, together with his age, residence, place of birth, and the school or system of medicine to which he professes to belong. The person so registering shall subscribe and verify by oath, before such Clerk, an affidavit containing such facts, and that he is the person named in the authority so registered, which, if wilfully false, shall subject the affiant to conviction and punishment for perjury.

§ 3. That authority to practice medicine under this act shall be: (a) A diploma from a medical school legally chartered under the laws of the State. (b) A diploma from a reputable and legally chartered medical school of some other state or country, certified and endorsed as such by the State Board of Health. (c) An affidavit from the person claiming the same that such person is exempted from obtaining a diploma under section two of the act to which this is an amendment,\* and stating where he has so practiced: *Provided*, That no college shall charge or receive more than one dollar for the certificate and endorsement required by this section.

§ 4. That nothing in this act shall be so construed as to discriminate against any peculiar system or school of medicine, or to prohibit women from practicing midwifery, or to prohibit gratuitous services in case of emergency, nor shall this act apply to commissioned surgeons of the United States Army, Navy, or Marine Hospital service.

§ 5. That sections three, four, five, six and seven, of the act to which this is an amendment, and any portion of other sections of said act in conflict with the provisions of this act, are hereby repealed, and that section eight of said act is hereby reaffirmed and made a part of this act.

Approved April 25, 1888.

\* \* \* \* \*

§ 2. Nothing in this act, or the acts to which this is an amendment, shall be so construed as to authorize any traveling empiric to register or practice medicine in any county in this State; to open an office for such purpose, or to announce to the public in any other way his readiness to practice medicine in any of its branches in any county, shall be to engage in the practice of medicine within the meaning of the law.

Approved May 24, 1890.

\* \* \* \* \*

§ 8. Any person living in this State, or any person coming into this State, who shall practice medicine, or attempt to practice medicine, in any of its departments, or who shall perform, or attempt to perform, any surgical operation, for or upon any person within the limits of this State, for reward or compensation, in violation of the provisions of this act, shall, upon conviction thereof, be fined fifty dollars, and upon each and every subsequent

\* That is, was reputably and honorably engaged in practice prior to February 23, 1864.



conviction shall be fined one hundred dollars and imprisoned thirty days, or either, or both, in the discretion of the jury; and in no case, where any provision of this act has been violated, shall the person so violating be entitled to receive compensation for services rendered.

Approved February 23, 1874.

"The new medical practice act has been promptly complied with by the physicians of the state, and has proven very popular with both the medical profession and the public. The provision which prohibits traveling empirics from registering or practicing upon any terms seems to be especially commendable. Outside of the city of Louisville little remains to be accomplished by the law except in regard to those who are exempted from obtaining a diploma on account of the length of time they have been engaged in practice, but a few years' time will cure this defect. We estimate that since the law has been in operation between four and five hundred men have been forced to retire from practice or leave the State." (Letter from J. N. McCormack, M. D., Secretary, Dec. 6, 1890.)

## MEDICAL DEPARTMENT OF TRANSYLVANIA UNIVERSITY.

LEXINGTON, Ky.

ORGANIZED in 1817. Lectures were delivered until 1859, when the institution became extinct. From 1850 to 1859 lectures were delivered during the summer only, the winter session being intermitted to establish the Kentucky School of Medicine at Louisville.

## UNIVERSITY OF LOUISVILLE, MEDICAL DEPARTMENT.

LOUISVILLE, Ky. J. M. BODINE, M. D. Dean, Eighth and Chestnut streets.

ORGANIZED in 1837. No lectures were delivered from June, 1862, to June, 1863, and no class was graduated in 1863.

The faculty consists of eight professors, two lecturers, four demonstrators, one assistant demonstrator and three clinical assistants.

**COURSE OF INSTRUCTION:** The fifty-fourth regular annual session began September 15, 1890, and continues until March 4, 1891. A preliminary session free to all medical students, began September 1, 1890, and continued until the opening of the regular session. The spring course for 1891, will commence February 24, 1891, and terminates on the first of June; attendance upon this course does not count in requirements for graduation. Clinics given at dispensary and hospitals. Frequent quizzes are conducted by the faculty.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, and medical jurisprudence, clinical medicine and surgery, diseases of women and children, microscopy, diseases of the throat and chest, ophthalmology and otology, bacteriology.

**REQUIREMENTS:** For admission: 1) Evidence of good moral standing; 2) a good English education, including mathematics and the elementary principles of physics. An examination on these subjects, as taught in the common schools, will be conducted by a committee of the faculty. Graduates of a literary or scientific college, high school or academy, or those who have passed the entrance examination to the same, gentlemen having a county or state teacher's certificate, graduates in medicine, and previous matriculates of this college, will be exempt from this examination.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) not less than three years' study; 4) two complete courses of lectures; 5) two courses of practical anatomy; 6) two courses of clinical and hospital instruction; 7) examination in all the branches taught in the college.

**FEES:** Matriculation, \$5; lectures, \$75; demonstrator, \$10; hospital, \$5; graduation, \$30; spring course, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	213	100	46.9
1881-82	181	96	53+
1882-83	194	68	35+
1883-84	196	84	42.6
1884-85	173	74	42.7
1885-86	164	81	49.3
1886-87	248	87	35+
1887-88	252	100	39.6
1888-89	312	131	41.9
1889-90	323*	145	44.8

Percentage of graduates to matriculates for past ten years, 42.8.

\*Not including six graduates who matriculated.

## ECLECTIC MEDICAL COLLEGE.

LOUISVILLE, Ky.

CHARTERED in 1848.—Extinct.

## KENTUCKY SCHOOL OF MEDICINE.

LOUISVILLE, Ky. WM. H. WATHEN, M. D., Dean, "The Fonda," Fourth avenue.

ORGANIZED in 1850, as the lineal descendant of and the successor to the Medical Department of Transylvania University, at Lexington, Kentucky. The first class was graduated in 1851. Classes have been graduated each subsequent year.

The faculty consists of eight professors, two lecturers, one demonstrator, one assistant demonstrator and seven assistants to chairs.

COURSE OF INSTRUCTION: The thirty-fifth annual session begins February 1, 1891, and will continue twenty weeks. A three years' graded course is recommended, but not required. Clinics at hospital and dispensary. "Each professor quizzes the class on his own lectures as they proceed."

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, microscopy, ophthalmology, otology, laryngology, dermatology, venereal diseases, diseases of children, diseases of the rectum, clinical medicine and surgery, and bacteriology.

REQUIREMENTS: For admission: "No reading or studying of medicine is required before entering college. Students who fail to bring with them proper evidence of their preliminary education are required to pass a satisfactory examination before a committee of the faculty, in mathematics, English composition, elementary physics, etc., but any student holding a diploma from a good literary or scientific school, or a first-grade teacher's certificate will be excused from this examination.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study of medicine and two full courses of lectures, the interval between the beginning of the first and the close of the second course must be at least fifteen months; 4) "dissection of the several regions of the body;" 5) hospital clinics each year of attendance; 6) one course in practical chemistry; 7) examination on all branches taught in the college. "If, after examination for the degree, he be found to have received three negative votes, he shall be entitled to another examination. Should he decline this he may withdraw, and will not be considered as rejected. The degree will not be conferred upon any candidate who is often absent from the regular lectures of the college, or who absents himself from the public commencement without special permission of the faculty."

FEES: Matriculation, (each year), \$5; hospital, \$5; lectures, \$75; graduation, \$30; laboratory, \$5; dissection (including material), \$12.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880	107	43	40.1
1882	132	55	41.6
1883	158	51	32.2
1884	159	55	34.5
1885	120	56	46.6
1886	175	60	34.2
1887	170	64	37.6
1888	198	59	29.8
1889	257	104	40.4
1890	302*	101	33.4

Percentage of graduates to matriculates for ten years reported, 36.4.

NOTE. "After the session of 1892 the reputable medical colleges of the United States will probably require all students who apply for the degree of Doctor of Medicine to have attended three full courses of lectures. Students, however, who matriculate in the Kentucky School of Medicine for the session of 1891, may apply for the degree in 1892."

## LOUISVILLE MEDICAL COLLEGE.

LOUISVILLE, Ky. C. W. KELLY, M. D., Registrar, Second and Green streets.

ORGANIZED in 1839. First class was graduated in 1870. Classes have been graduated each subsequent year.

---

\*Not including one graduate who matriculated.

The faculty consists of nine professors, four adjunct professors, one lecturer and one demonstrator.

**COURSE OF INSTRUCTION:** The collegiate year of 1890-91, which began September 1, 1890, embraces a preliminary course of three weeks and a regular winter session extending from September 21, 1890, to the last week in February, 1891. Daily quizzes are held by the faculty. "The plan of instruction includes lectures, clinics, quizzes and practical demonstrations."

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene and medical jurisprudence, clinical medicine and surgery, ophthalmology and otology, histology. Special demonstrations nightly upon the cadaver, in dissecting room.

**REQUIREMENTS:** For admission: "A preliminary examination will be required hereafter, as a condition of admission to the regular winter course. Gentlemen who are graduates of a literary or scientific college, academy, or high school, or who have passed the entrance examination to a literary school in good standing; who have a county or state teacher's certificate; graduates in medicine; previous matriculates of this college; and students who desire to pursue a special course of study—other than for the purpose of securing the degree—will be exempt from this examination. The examination will include the writing of a brief paper on a subject to be given; and an examination in the elementary principles of physics and mathematics as taught in the public schools of the country."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of lectures not completed within fifteen months; 5) two courses of hospital clinics; 6) dissection of each region of the body; 7) one course in practical chemistry; 8) satisfactory written or oral examination on each branch taught.

**FEES:** Matriculation, \$5; demonstrator, \$10; lectures, \$50; examination, \$30; hospital, \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	116	54	46.5
1881-82	125	54	43.1
1882-83	157	51	32.4
1883-84	267	76	28.5
1884-85	203	63	31
1885-86	230	85	36.9
1886-87	180	62	34.4
1887-88	272	94	34.5
1888-89	279	103	36.9
1889-90	273	105	38.4

Percentage of graduates to matriculates for past ten years, 35.5.

## HOSPITAL COLLEGE OF MEDICINE.

(Medical Department, Central University of Kentucky.)

LOUISVILLE, Ky. JAS. LEWIS HOWE, M. D., Dean, 324 E. Chestnut street.

**ORGANIZED** in 1873 First class was graduated in 1875. Classes have been graduated each subsequent year.

**FACULTY** consists of nine professors, one adjunct professor, three lecturers, two assistants, one clinical lecturer and two demonstrators.

**COURSE OF INSTRUCTION:** The fall and winter session of 1890-91 began September 23, 1890, and continued until the opening of the regular session. The nineteenth annual graduating course begins January 27, 1891, and ends June 17, 1891. The clinics continue throughout the year. Didactic instruction and personal quizzes by the faculty.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology, otology and laryngology, toxicology, clinical medicine and surgery, diseases of children, surgical pathology, normal and pathological histology, including a study of bacterial pathology, orthopedics, demonstrations in anatomy, microscopy and diseases of the nervous system.

**REQUIREMENTS:** For admission—1) "credible certificate of good moral character; 2) diploma of graduation from a good literary and scientific college or high school, or a first grade teacher's certificate; or, lacking this, an examination in the branches of a good English education, including mathematics, English composition, and elementary physics or natural philosophy."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) satisfactory evidence of having studied medicine for at least three years, under a regular graduate or licentiate and practitioner of medicine in good standing, using the word "regular" in the sense commonly understood in the medical profession. No candidate shall be eligible for

final examination unless his term of three years shall have been completed, or shall expire at a date not later than three months after the close of the final examinations; 4) two complete courses of lectures (not within one and the same year); 5) practical anatomy, two sessions; 6) two courses of clinical and hospital instruction; 7) regular attendance upon the daily lectures, quizzes, dissections and clinics; 8) examination on all branches taught in the college.

**All students entering this college after the session of 1891, will be required to attend "three courses of lectures in separate years," and study medicine four years prior to graduation.**

**FEES:** Matriculation, \$5; lectures, \$75; demonstrator, \$10; dissecting material at cost; hospital, \$5; graduation, \$25; "unofficial course for students, who have attended one course of lectures in winter schools, not entitling to graduation, \$25;" post-graduate and laboratory fall course, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	77	31	40.2
1882	75	36	48.
1883	87	31	35.6
1884	57	31	54.4
1885	50	26	52.
1886	39	18	45.7
1887	61	27	44.2
1888	71	20	28.1
1889	123	62	50.4
1890	124*	49	39.5

Percentage of graduates to matriculates for past ten years, 43.3.

**REMARKS:** "To encourage diligence in study and reward the meritorious, the faculty have established the Roll of Honor, open to any candidate for graduation who will undergo written examinations and attain a standard of ninety in one hundred. The diplomas will be marked **DISTINGUISHED**, and the names will be so published in the list of the alumni of the college."

## JEFFERSON SCHOOL OF MEDICINE.

LOUISVILLE, Ky.

ORGANIZED in 1882. This school graduated one class (in 1882) and then suspended.

## THE LOUISVILLE NATIONAL MEDICAL COLLEGE.

LOUISVILLE, Ky. HENRY FITZBRUTLER, M. D., Dean, 503 Centre street.

CHARTERED April 22, 1888.

The faculty consists of eleven members and one demonstrator. Regular term will open October 14, 1890, and continue six months. A mixed medical school composed of colored and white students and teachers. Out of six students who graduated at the term of 1889 of this school, after only a five months course of lectures, four are now professors in the school.

**COURSE OF INSTRUCTION:** A three years' course of study is required. All branches of medical science are taught and ample clinical advantages are afforded. Lectures embrace materia medica, physiology, chemistry, anatomy, practice of medicine, surgery, toxicology, obstetrics, ophthalmology, diseases of children, catarrh, bacteriology, dermatopathia, medical jurisprudence and etiology, gynecology, histology, pathology.

**REQUIREMENTS:** For admission: 1) A practical knowledge of the English language, and a good moral character; 2) physical maturity.

For graduation: **None.**

**FEES:** Matriculation, \$4; lectures, \$25; chemistry, \$9; demonstrator, \$9; graduation, \$15; scholarships, \$20.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1888-89	15	6	40
1889-90	18	2	11.1

Percentage of graduates to matriculates for the past two years, 24.2.

**Diplomas not recognized.**

---

\*Not including two graduates who matriculated.

**LOUISIANA.****MEDICAL DEPARTMENT, TULANE UNIVERSITY OF LOUISIANA.**

[Formerly (1847-84) the University of Louisiana.]

NEW ORLEANS, La. STANFORD E. CHAILLE, M. D., Dean of the Faculty, P. O. drawer 261.

ORGANIZED in 1834, as the Medical College of Louisiana. Transferred to the Medical Department of the University of Louisiana in 1847. The civil war caused a suspension during the years 1863, 1864 and 1865. The institution was reopened and its annual course of instruction resumed in October, 1865. In 1884 it assumed its present title.

The faculty consists of seven professors, four lecturers, two demonstrators, one assistant demonstrator, one instructor in pharmacy, eleven chiefs of clinics, four clinical instructors and three assistants.

**COURSE OF INSTRUCTION:** The annual course of instruction in this college, now in its fifty-seventh year, commenced October 20, 1890, and closes March 28, 1891. A three years' graded course is recommended but not required. Daily rounds of the Charity Hospital wards are made by all the professors and chiefs of clinics, accompanied by the students. A three years' graded course is recommended.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene (compulsory), physical diagnosis, ophthalmology, otology, pharmacy, clinical medicine, surgery and obstetrics, diseases of children, dermatology, microscopy and bacteriology.

**REQUIREMENTS:** For admission: **None.**

For graduation, 1) good moral character; 2) twenty-one years of age; 3) three years' study of medicine; 4) two complete courses of dissection and of lectures; 5) thesis; 6) pass satisfactory examination.

**FEES:** Matriculation, \$5; lectures, \$140; demonstrator, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	204*	41	20
1881-82	220*	56†	25.4
1882-83	212*	73	34.4
1883-84	212*	70†	33
1884-85	192	64	33
1885-86	208	67	32.2
1886-87	216	57	26.3
1887-88	277	73	26.3
1888-89	268	78	29.1
1889-90	307	93	30.2

Percentage of graduates to matriculates for past six years, 29.4.

**NEW ORLEANS SCHOOL OF MEDICINE.**

NEW ORLEANS, La.

ORGANIZED in 1856.—Extinct since April, 1870.

**CHARITY HOSPITAL MEDICAL COLLEGE.**

NEW ORLEANS, La.

ORGANIZED in 1873.—Extinct since 1877.

**MEDICAL DEPARTMENT OF STRAIGHT UNIVERSITY.**

NEW ORLEANS, La.

No instruction was ever given.

\*Includes pharmacy students.

†Includes pharmacy graduates.

## NEW ORLEANS UNIVERSITY, MEDICAL DEPARTMENT.

(For Colored Students.)

NEW ORLEANS, La. REV. L. G. ADKINSON, A. M., D. D., President of the University.

ORGANIZED in 1889. The faculty consists of three professors two lecturers and one demonstrator. Additions will be made as the number of students increase.

COURSE OF INSTRUCTION: The second session opened October 1st, 1890, and will continue twenty weeks. A graded course of study of three years has been established, and "will be thorough and practical." Women admitted on the same terms as men.

Lectures embrace, for the first year—anatomy, chemistry and physiology; for the second year—anatomy, materia medica, theory of medicine, medical chemistry, pharmacy, toxicology, histology and microscopy; for the third year—surgery, gynecology, medical jurisprudence, hygiene, ophthalmology, arylagology, dermatology and electro-therapeutics.

REQUIREMENTS: For admission: At least eighteen years of age; good moral character; satisfactory examination in branches of a common school education, including elements of physics, or diploma from a literary or scientific college or normal school.

For graduation: 1) twenty-one years of age; 2) **three full courses of lectures;** 3) satisfactory written examination, including the outline of Bible history and doctrine; 4) thesis.

FEES: Lectures, per session, \$25; graduation, \$10.

**MAINE.**

## MEDICAL SCHOOL OF MAINE, AT BOWDOIN COLLEGE.

BRUNSWICK, Me. ALFRED MITCHELL, M. D., Secretary.

ORGANIZED in 1820. First class was graduated in 1820. Classes have been graduated each subsequent year.

Faculty consists of nine professors and two demonstrators.

COURSE OF INSTRUCTION: One annual course of lectures of twenty weeks' duration, commencing February 5, 1891, and ending June 24, 1891. Clinics are given once a week. Daily examinations are made by the faculty.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, and gynecology, medical jurisprudence, hygiene, histology, diseases of children, microscopy.

REQUIREMENTS: For admission: "Candidates for matriculation will be required to give evidence that they possess a good English education. Those who are graduates of colleges, normal schools, high schools, or who have passed the entrance examination to any recognized college, on presentation of their diplomas or matriculation tickets, will be exempt from examination."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study under a regular practitioner, and two full courses of lectures; dissection of not less than two parts; 4) satisfactory written and oral examination on subjects of the lectures; 5) thesis.

FEES: Matriculation, \$5; lectures, \$78; graduation, \$25; laboratory, \$10.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	115	30	26.4
1882	104	28	26.9
1883	94	28	29.7
1884	99	33	33.3
1885	66	14	21.2
1886	85	20	23.5
1887	84	20	23.8
1888	86	21	24.4
1889	71	24	33.8
1890	81	16	19.7

Percentage of graduates to matriculates for the past ten years, 26.4.

**After the session of 1892 attendance upon three full courses of lectures will be required.**

## PORTLAND SCHOOL FOR MEDICAL INSTRUCTION.

PORTLAND, Me. C. O. HUNT, M. D., Registrar.

ORGANIZED in 1855. No diplomas are conferred. "The aim of the school is to afford to medical students greater facilities for obtaining a higher grade of professional education than can usually be given under the direction of a single instructor."

The faculty consists of nine instructors and three adjunct instructors.

COURSE OF INSTRUCTION: Two terms of thirteen weeks each, annually, beginning in July and October.

Systematic recitations will be held in anatomy, materia medica and therapeutics, theory and practice of medicine, surgery, chemistry and obstetrics.

Lectures embrace, in addition to the foregoing subjects, physical diagnosis, minor and operative surgery, gynecology and physiology; every facility given for dissecting.

REQUIREMENTS: For admission—"Students will be required to satisfy the instructors that they are possessed not only of a good common school education, but also of such familiarity with the Latin language as may be acquired by the study of Harkness' Introductory Latin Book and of a knowledge of physics equal to that which may be gotten from Norton's Elements of Natural Philosophy. The fact of graduation from a college or from a high school or academy, whose curriculum requires the study of these books or the equivalent, will be taken as evidence of these acquirements; but in the absence of such evidence a written examination will be held in which the orthography and syntax will be taken into account. A practical acquaintance with the metric system must be possessed on entrance or made up within the first month of study in the school."

FEES; For summer term, \$35; for winter term, \$40; for the year, \$60; demonstrator, \$8. Twenty-two students attended in the class of 1889.

## ECLECTIC MEDICAL COLLEGE OF MAINE,

LEWISTON, Me.

ORGANIZED in 1881. Charter revoked by the Legislature of Maine in 1887.

**Diplomas not recognized.**

## THE DRUIDIC UNIVERSITY OF MAINE.

LEWISTON, Me.

INCORPORATED in 1880. Charter revoked by the Legislature of Maine in 1887.

**Diplomas not recognized.**

## MARYLAND.

### UNIVERSITY OF MARYLAND, SCHOOL OF MEDICINE.

BALTIMORE, Md. I. E. ATKINSON, M. D., Dean, 605 Cathedral street.

ORGANIZED in 1807, as the Medical College in the City of Baltimore. In 1812, faculties of law, theology and arts were added, and the whole chartered under the name of the University of Maryland. The degree of M. D. was conferred in 1810, and degrees have been conferred each year since.

The faculty consists of nine professors, five lecturers, two demonstrators, one clinical professor, and eleven dispensary physicians and chiefs of clinics.

COURSE OF INSTRUCTION: The eighty-fourth annual session began October 1, 1890, and closes about April 15, 1891. Clinical lectures introductory to the regular session were held throughout September. Classes for post graduate instruction, continuing about six weeks, are formed throughout the year, as often as desirable.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, toxicology, ophthalmology, otology, diseases of the throat and chest, diseases of children, diseases of the nervous system, dermatology, clinical medicine and surgery.

**REQUIREMENTS:** For admission: **Beginning with the session of 1891-92, students matriculating for the first time will be required to undergo a preliminary examination, or furnish satisfactory evidence of sufficient literary training, and to attend a three years' graded course.**

For graduation: 1) Twenty-one years of age; 2) two full courses of lectures; 3) satisfactory course in practical anatomy; 4) good moral character; 5) faithful and regular attendance on lectures and all clinics; 6) satisfactory examination in all branches taught.

**FEEs:** Matriculation, \$5; lectures, \$120; demonstrator, \$10; graduation, \$30; post-graduate course, \$7 to \$20 each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	193	73	37.9
1881-82	197	73	37.8
1882-83	203	97	47.7
1883-84	188	74	39.3
1884-85	200	75	37.5
1885-86	198	78	39.3
1886-87	232	90	38.7
1887-88	266	82	30.7
1888-89	277	111	40.+
1889-90	262	81	30.9

Percentage of graduates to matriculates for past ten years, 37.6.

## WASHINGTON UNIVERSITY SCHOOL OF MEDICINE.

BALTIMORE, Md.

ORGANIZED in 1827, as the Medical Department of Washington College, Pennsylvania. Classes were graduated under the auspices of Washington College until 1840, when the Maryland Legislature empowered the institution to assume the above title. Extinct in 1851, Reorganized in 1867, and lectures were delivered until 1877, when the institution was merged into the College of Physicians and Surgeons, Baltimore (*vide infra*).

## COLLEGE OF PHYSICIANS AND SURGEONS.

BALTIMORE, Md. THOMAS OPIE, M.D., Dean, N. W. corner Calvert and Saratoga streets.

ORGANIZED in 1872. The first class was graduated in 1873. Classes have been graduated each subsequent year. In 1877 the Washington University School of Medicine was united with this college.

The faculty consists of nine professors, five lecturers, four demonstrators, three assistant demonstrators and one prosector.

**COURSE OF INSTRUCTION:** Two courses of lectures are given during the year, a winter and spring course. The winter session will be preceded by preliminary lectures, chiefly clinical in character, which begin September 15 and end October 1, 1890. The regular winter session will begin October 1, 1890, and end April 1, 1891, and will consist of five or six lectures daily, didactic and clinical. The spring session will begin April 1st and end June 15, 1891. Attendance upon the spring course is not obligatory, and will not be counted as a session in the requirement for graduation. A three years' graded course is recommended and provided for, but is not obligatory. Clinics in hospitals and dispensary. A new college building was erected, special attention being directed to the construction of laboratories for practical work in physiology, chemistry, normal and pathological histology and bacteriology. These laboratories will be fully equipped with apparatus and microscopes necessary for carrying on the work of the various departments. A system of bedside teaching has been inaugurated, and the class will be divided into sections and taken through the wards of the various hospitals (eight in all) which are at the disposal of the faculty. The teaching staff has been enlarged into sections for practical work, so that the student may have the advantage of personal instruction. A new city hospital has also just been completed, capable of accommodating 300 patients, and is under the control of the college.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology, otology, pharmacy, diseases of the chest and throat, diseases of children, diseases of the nervous system, diseases of the mind, clinical medicine and surgery, dermatology and medical electricity.

**REQUIREMENTS:** For admission: **None.**

For graduation; 1) twenty-one years of age; 2) good moral character; 3) good English education; 4) three years' study; 5) two courses of lectures; 6) satisfactory examination.



**FEES:** Matriculation, \$5; lectures, \$120; graduation, \$30; laboratory materials, \$4; spring term, \$15. "A number of scholarships are bestowed upon students when recommended by their preceptors, or other physicians in good professional standing, as unable to pay the full fees. The holders of such scholarships pay \$60 for professors tickets."

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	328	143	43.6
1881-82	346	153	45.7
1882-83	322	109	33.9
1883-84	400	127	31.7
1884-85	426	155	36.3
1885-86	341	149	43.6
1886-87	320	90	28.1
1887-88	235	79	33.6
1888-89	290	67	23.1
1889-90	328	72	21.9

Percentage of graduates to matriculates for past ten years, 34.4.

**NOTE.**—At the recent meeting of the Association of American Medical Colleges, of which body the College of Physicians and Surgeons is a member, the following resolution was adopted:

"All candidates for admission to a medical college shall be required to stand a preliminary examination, except those who are graduates of colleges or high schools.

The course of instruction shall extend over three years, six months' session, graded course, with laboratory instruction. This change to go into effect in the session of 1892.

No medical college is to be recognized by the Association that does not adhere to this rule.

This rule will affect only those who matriculate for the session of 1892 and thereafter."

## BALTIMORE MEDICAL COLLEGE.

BALTIMORE, Md. DAVID STREET, M. D., Dean, 403 N. Exeter street.

**ORGANIZED** in 1881. First class was graduated in 1882, and classes have been graduated each subsequent year.

The faculty consists of eleven professors, three lecturers, one demonstrator and one professor.

**COURSE OF INSTRUCTION:** A preliminary fall course will be held during the month of September. The regular winter session for 1890-91 commenced October 1, 1890, and will end about the middle of April, 1891. Three years' graded course recommended, but not required. Attendance upon clinics is obligatory.

Lectures embrace surgery, anatomy, pathology, chemistry, materia medica and therapeutics, theory and practice of medicine, physiology, obstetrics, orthopedic surgery, gynecology, diseases of children, hygiene and sanitary science, medical jurisprudence, toxicology, ophthalmology and otology, diseases of the nose, throat and chest, diseases of the nervous system and insanity, practical pharmacy, diseases of the genito-urinary organs, microscopy, and the usual clinics held in every school.

**REQUIREMENTS:** For admission: **None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) satisfactory examination.

**FEES:** Matriculation, \$5; lectures, \$100; graduation, \$30.

"Special privileges are sometimes granted to poor but deserving young men in conformity with the usages of the times, and these are only required to pay one-half the regular fees."

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	46	17	38.2
1882-83	52	20	38.4
1883-84	23	14	50.
1884-85	25	8	32.
1885-86	40	8	20.
1886-87	50	10	20.
1887-88	50	17	34.
1888-89	70	21	30.
1889-90	101	35	34.6

Percentage of graduates to matriculates for past nine years, 32.4.

## WOMAN'S MEDICAL COLLEGE OF BALTIMORE.

BALTIMORE, Md. RANDOLPH WINSLOW, M. D., Dean, No. 1 Mt. Royal Terrace.

ORGANIZED in 1882. The first class was graduated in 1883.

The faculty consists of eleven professors, three lecturers, four demonstrators, one assistant demonstrator, one instructor in pharmacy, nine clinical assistants, and one lecturer adjunct.

**COURSE OF INSTRUCTION:** One annual graduating session; that of 1890-91 began October 1, 1890, and continues until the 1st of May, 1891. **The course of study is graded and a three-years' course, of seven months each course, is required.**

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, principles and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, ophthalmology and otology, diseases of throat and chest, diseases of children, histology, pharmacy, clinical medicine, surgery and midwifery.

**REQUIREMENTS:** For admission—"Every student entering this institution will be required to present, 1) a credible certificate of a good moral character; 2) a diploma from a respectable institution of learning, or a first-grade teacher's certificate. Lacking this, she must pass a satisfactory examination before a committee of the faculty on the usual elementary English branches taught in public schools, and write a composition of at least twenty lines upon some subject dictated by the committee."

For graduation: 1) twenty-one years of age; 2) **three full courses of lectures;** 3) dissection of entire body; 4) evidence of having attended the clinics; 5) examination on all the branches; 6) good moral character.

**FEES:** Matriculation, \$5; lectures, \$75; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	19	1	5.2
1883-84	22	5	22.7
1884-85	9	4	44.4
1885-86	14	3	21.4
1886-87	16	2	20.
1887-88	16	3	18.7
1888-89	19	2	10.5
1889-90	19	7	36.8

Percentage of graduates to matriculates for past eight years, 21.

## BALTIMORE UNIVERSITY SCHOOL OF MEDICINE.

BALTIMORE, Md. Z. K. WILEY, M. D., Dean, 724 N. Carey street.

ORGANIZED in 1884. First class graduated in 1885.

The faculty consists of eleven professors, two demonstrators, two lecturers, one professor.

**COURSE OF INSTRUCTION:** One annual graduating session; that of 1890-91 opened October 1, 1890, and will terminate about the 15th of March, 1891. A one month's course of preliminary lectures preceded the regular term. Spring course commences April 1st and continues until June 30th. Three years' graded course is recommended, but not required.

Lectures embrace anatomy, physiology, pathology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics, gynecology, microscopy, diseases of throat and lungs, nervous diseases, ophthalmology and otology, diseases of women, diseases of children, dermatology, medical jurisprudence, hygiene, toxicology and medical classics.

**REQUIREMENTS:** For admission: "Students must be possessed of good moral character, and, unless matriculates of some literary institution or medical college, will be required to furnish sufficient evidence of possessing a good English education."

For graduation: Candidates must have attended at least two courses of lectures. "The fitness of a candidate for graduation will be based upon good moral character and regular attendance upon instruction afforded by the college, and upon the result of a final examination, to be determined by a majority of all the votes of the faculty. Thesis, or clinical report of cases drawn up from personal observation, required."

**FEES:** Matriculation, \$5; demonstrator, \$10; lectures, \$50; graduation, \$30; single tickets, \$5 each chair. Spring course, \$15.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1884-85	15	6	40.
1885-86	33	17	51.5
1886-87	37	18	48.6
1887-88	30	15	50.
1888-89	31	16	51.6
1889-90	49	27	55.1

Percentage of graduates to matriculates for past six years, 50.7.

### **Diplomas recognized conditionally.**

## **JOHNS HOPKINS UNIVERSITY, MEDICAL DEPARTMENT.**

BALTIMORE, Md. D. C. GILLMAN, LL. D., President of the University.

ORGANIZED 1888-89.

The officers of instruction are nine professors and seven assistants.

During the year 1890-91, instruction will be given at the Johns Hopkins Hospital in pathology and bacteriology, medicine, surgery, gynecology, hygiene, psychiatry and diseases of the nervous system, by lectures, demonstrations, laboratory courses, bed-side teaching and general clinics in the laboratories, wards, dispensary, amphitheatre and private operating rooms. The completed hospital was formally opened with appropriate ceremonies, May 7, 1889.

Special instruction is given also in diseases of children, diseases of the nervous system, microscopy, uriology, electro-therapeutics, ophthalmology, otology, dermatology. A course of instruction in practical hygiene, under the charge of Dr. John S. Billings, Surgeon U. S. Army, and lecturer in hygiene in the Johns Hopkins University, will be given in this institution during the months of March, April and May, 1891, by lectures, and practical work in the laboratory.

These courses of instruction in medicine, surgery and gynecology are open only to graduates in medicine, who must give satisfactory evidence to the officers of the hospital that they are fitted to profit by the courses.

The courses in pathology, bacteriology and hygiene are open to graduates in medicine and advanced students in biology.

**FEES:** The charge for full course in pathology, medicine, surgery, gynecology and hygiene is \$50 each; for single branch in either course, \$25.

These fees will include all lectures and clinics in the special departments for which payment has been made.

Graduates of medical colleges may be admitted to all of the above-mentioned courses for the sum of \$100.

Graduates in medicine who desire to attend the didactic lectures only, may do so by paying a proportionate fee. Such attendants upon lectures are not entitled to special courses of instruction without further payment.

The course "is entirely post-graduate, and will be for several years, until we have the half million necessary" to begin the medical school. (Letter from Professor Osier.)

## **MASSACHUSETTS.**

### **HARVARD UNIVERSITY MEDICAL SCHOOL.**

Boston, Mass. H. P. BOWDITCH, M. D., Boylston and Exeter streets.

ORGANIZED in 1782. The first class was graduated in 1783, and classes have been graduated in each subsequent year.

The officers of instruction are: Sixteen professors, five assistant professors, two clinical professors, one curator, three demonstrators, one assistant demonstrator, fourteen instructors, eighteen assistant instructors, two lecturers and thirteen special clinical instructors. The faculty consists of the professors, assistant professors and other officers of instruction appointed for a longer term than one year.

**COURSE OF INSTRUCTION:** Instruction in this school is given by lectures, recitations, clinical teaching and practical exercises, uniformly distributed throughout the academic

year. The year begins on the Thursday following the last Wednesday in September, and ends on the last Wednesday in June. The course of study recommended by the faculty covers four years, but the degree of Doctor of Medicine continues to be given upon the completion of three years' study. The degree of Doctor of Medicine *cum laude* is given to candidates who have pursued a complete four years' course, and obtained an average of 75 per cent. in all the examinations of this course; and a certificate of attendance on the studies of the fourth year will be given to such students, desiring it, as shall have attended the course, and have passed a satisfactory examination in the studies of the same.

The division of studies in the three years' course is as follows: First year—*anatomy, physiology, general chemistry, materia medica and hygiene*. Second year—*practical and topographical anatomy, medical chemistry, pathological anatomy, clinical medicine, diseases of children, surgery and clinical surgery, therapeutics*. Third year—*obstetrics, theory and practice of medicine, clinical medicine, surgery, clinical surgery, bacteriology, ophthalmology, dermatology, syphilis, otology, laryngology, mental diseases, diseases of the nervous system, diseases of women, diseases of children and forensic medicine*.

In the four years' course, the first and second years' studies are the same as in the three years' course; and in the third year of the four years' course attention is confined to therapeutics, obstetrics, theory and practice of medicine, clinical medicine, surgery and clinical surgery. During the fourth year the subjects are ophthalmology, otology, dermatology, syphilis, laryngology, mental diseases, diseases of the nervous system, diseases of women, diseases of children, obstetrics, clinical and operative obstetrics, clinical medicine, clinical and operative surgery, forensic medicine, hygiene and bacteriology.

Opportunities for original research are offered to advanced students and graduates in the laboratories of anatomy, physiology, chemistry, histology and pathology. Facilities for clinical study are afforded in the Massachusetts General Hospital, the Boston City Hospital, the Massachusetts Charitable Eye and Ear Infirmary, the Marine Hospital at Chelsea, the Boston Dispensary and the free Hospital for Women. There are twenty-five appointments annually for *internes* in the various hospitals, and as many more for assistants in the out-patient departments.

**REQUIREMENTS:** "All candidates for admission, except those who have passed an examination for admission to Harvard College, must present a degree in letters, science or medicine from a recognized college or scientific school, or pass an examination in the following subjects: 1) every candidate will be required to write, legibly and correctly, an English composition of not less than two hundred words, and also write English prose from dictation; 2) the translation of easy Latin prose; 3) a competent knowledge of physics; 4) each candidate must pass an approved examination in any one of the following subjects: French, German, the elements of algebra or plane geometry, botany. Students who began their professional studies elsewhere may be admitted to advanced standing, but all persons who apply for admission to the advanced classes must pass an examination in the branches already pursued by the class to which they seek admission, and furnish a satisfactory certificate of time spent in medical studies. No student shall advance with his class or be admitted to advanced standing, until he has passed the required examination in the studies of the previous year or a majority of them; nor shall he become a member of the third class until he has passed all the examinations of the first, in addition to a majority of those in the second year."

**For graduation:** "Every candidate must be twenty-one years of age, and of good moral character; must give evidence of having studied medicine three or four full years; must have spent at least one continuous year at this school, and have passed the required examination." Written and oral examinations on all the main subjects of instruction are distributed, for regular students, through their entire course of study. "In addition to these written examinations, each student is required to present a written report of the analysis of a solution containing inorganic substances, and a specimen of urine, to examine and report upon a clinical case in surgery and medicine, and to take charge of and report upon six cases in obstetrics; each student must also have satisfactorily dissected the three parts of the body."

**FEES:** Matriculation (payable once only), \$5; lectures, full year, \$200; one-half year, \$120; fourth year, \$100; to graduates and students of other schools, \$200; special courses for graduates, \$10 to \$30 each; graduation, \$30.

Six scholarships of the value \$200 or \$300 are annually awarded to needy and deserving students.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	251	60	23.9
1881-82	233	77	33+
1882-83	229	74	33.3
1883-84	243	59	24.2
1884-85	249	60	24+
1885-86	264	66	25.
1886-87	271	83	30.6
1887-88	275	74	26.9
1888-89	273	56	20.5
1889-90	270	65	24+

Percentage of graduates to matriculates for past ten years, 26.3.

## BERKSHIRE MEDICAL COLLEGE.

(Medical Department of Williams College.)

PITTSFIELD, Mass.

ORGANIZED in 1843. Extinct in 1867. 1138 students were graduated.

## NEW ENGLAND BOTANICO-MEDICAL COLLEGE.

WORCESTER, Mass.

ORGANIZED in 1848. Reorganized in 1852 as the Worcester Medical College, Eclectic.

## WORCESTER MEDICAL COLLEGE.

(Eclectic.)

WORCESTER, Mass.

ORGANIZED in 1852.—See above. Removed to Boston in 1857, where one course of lectures was given (1857-58). Moved back to Worcester and became extinct in 1859.

## NEW ENGLAND FEMALE MEDICAL COLLEGE.

(Homeopathic.)

BOSTON, Mass.

ORGANIZED in 1848. Lectures were delivered and classes graduated until 1874, when it was merged into the Boston University School of Medicine, (*vide infra*).

## BOSTON UNIVERSITY SCHOOL OF MEDICINE.

(Homeopathic.)

BOSTON, Mass. I. TISDALE TALBOT, M. D., Dean, 66 Marlborough street.

ORGANIZED in 1873. The first class was graduated in 1874. Classes have been graduated each subsequent year. In 1874 the New England Female Medical College was united with this school.

The faculty consists of fourteen professors, four assistant professors, seventeen lecturers, two assistants, two demonstrators and one librarian.

**COURSE OF INSTRUCTION:** The school year is divided into three terms as follows: The first term began October 9, 1890, and continued to December 23, 1890; the second term began January 5, 1891, and continues to March 14, 1891; the third term begins March 23, 1891, and continues to June 3, 1891. **A three-years' graded course is required and a four years' graded course is recommended.** The degrees of Bachelor of Medicine and Bachelor of Surgery are granted to students of the four years' course at the end of the third year. To each term and each year certain studies are assigned, in which the student is required to become proficient, as shown by examination before entering upon more advanced studies.

The arrangement of studies for the three-years' course is as follows: First year—*anatomy, physiology, general chemistry, minor surgery, microscopy, histology, methodology and dissections.* Second year—*medical chemistry, surgery and surgical pathology, general pathology and pathological anatomy, special pathology and therapeutics, materia medica and pharmaceutics, obstetrics, gynecology, pedology, diseases of the chest, diseases of the throat and sanitary science.* Third year—*operative surgery, general pathology and pathological anatomy, special pathology and therapeutics, materia medica, practical and operative obstetrics, ophthalmology and otology, dermatology, insanity and nervous diseases, medical jurisprudence, "ethics and æsthetics," clinics and clinical reports in various departments, and a thesis.*

In the four-years' course the studies of the first year are the same as in the three-years course; *surgical anatomy, histology and microscopy* are substituted for *gynecology and pedology* in the second year; *operative surgery, practical and operative obstetrics, materia medica, special pathology and therapeutics, general pathology and pathological anatomy, pedology, gynecology and clinics* occupy the third year; and the fourth year continues *materia medica, clinics and clinical reports, and takes up ophthalmology, otology, dermatology, insanity, nervous diseases, medical jurisprudence, "ethics and æsthetics," and dispensary practice.*

**REQUIREMENTS:** For admission—"Candidates who have taken their first degree in arts, philosophy or science are admitted without examination. All others, before matriculation, are examined in the following branches: 1) in orthography, English composition and penmanship, by means of a page written at the time and place of examination; 2) arithmetic, geography and English grammar, if there be any doubt whether the candidate has sufficient attainment therein; 3) in elementary physics, by an examination in Stewart's Primer of Physics; 4) in Latin, by requiring a translation from Harkness' Latin Reader at sight. Candidates must be at least nineteen years old, or if they intend to pursue a four-years' course, within six months of nineteen.

For graduation: "Candidates for the degree of Bachelor of Medicine or Bachelor of Surgery must have studied medicine three full years, the last of which was in this school, and must have passed examination in all the branches of the first three years of the four-years' course in this school with a minimum average of eighty per cent. Candidates for the degree of Doctor of Medicine must be twenty-one years of age and of good moral character; must have studied medicine at least three years under competent instruction; must have attended at least three full and reputable courses of lectures, the last in this school; and must sustain a satisfactory examination. The candidate must also furnish a thesis in which shall be cited the authorities for all statements of fact and opinion advanced, other than original, and these latter he must be prepared to publicly defend.

**FEES:** Matriculation, \$5; laboratory, \$5; lectures, \$100; graduation, \$30; single tickets, \$20 each branch; dissecting material at cost.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	110	26	23.6
1881-82	110	29	26.3
1882-83	109	30	27.5
1883-84	97	34	35.
1884-85	91	26	28.5
1885-86	97	18	18.5
1886-87	100	28	28.
1887-88	107	35	32.7
1888-89	94	29	30.8
1889-90	94	27	28.7

Percentage of graduates to matriculates for past ten years, 27.05.

**A four-years' course will be required after the session of 1890-91.**

## COLLEGE OF PHYSICIANS AND SURGEONS.

Boston, Mass. C. P. THAYER M. D. Registrar, 34 Boyslston street.

**ORGANIZED** in 1880. The first class was graduated in 1881.

The faculty consists of ten professors, two lecturers, one instructor, one demonstrator and one prosector.

**COURSE OF INSTRUCTION:** The college term for the year of 1890-91 began Wednesday, October 1, 1890, and will end on Wednesday, April 1, 1891. Course of study is graded and extends over three years, but three courses of lectures are not absolutely demanded. Instruction consists of didactic lectures with demonstrations, clinical teaching, recitations and practical teaching on subjects involving manipulation. Women are admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, diseases of the nervous system, ophthalmology and otology, histology, dermatology, laryngology, diseases of children, orthopedic surgery, clinical medicine, clinical surgery and genito-urinary diseases.

**REQUIREMENTS:** For admission—**None.**

For graduation: 1) twenty-one years of age; 2) thesis; 3) three years' study; 4) two full courses of lectures; 5) dissected one full course; 6) fulfill all requirements of laboratory work; 7) satisfactory examination; 8) good moral character; 9) thesis; 10) possession of a sufficient knowledge of Latin.

**FEES:** Matriculation \$5; lectures, \$85; demonstrator, \$5; anatomical material for each part, \$3; laboratory, \$5; graduation, \$30; separate tickets, \$30, each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	24	—	—
1881-82	49	11	22.4
1882-83	34	10	16.6
1883-84	44	6	13.6
1884-85	45	5	14.1
1885-86	30	4	13.3
1886-87	30	8	26.6
1887-88	45	4	8.8
1888-89	59	9	15.2
1889-90	61*	15	24.5

Percentage of graduates to matriculates for past ten years, 17.1

## NEW ENGLAND UNIVERSITY OF ARTS AND SCIENCES.

Boston, Mass.

Fraudulent.—Extinct. Exposed by the ILLINOIS STATE BOARD OF HEALTH.

## BELLEVUE MEDICAL COLLEGE OF MASSACHUSETTS.†

Boston, Mass.

ORGANIZED in 1880. Fraudulent, exposed by the ILLINOIS STATE BOARD OF HEALTH in 1882.

## MEDICAL DEPARTMENT OF THE AMERICAN UNIVERSITY OF BOSTON.†

## FIRST MEDICAL COLLEGE OF THE AMERICAN HEALTH SOCIETY.†

## EXCELSIOR MEDICAL COLLEGE.†

Boston, Mass.

CHARTERED May 1, 1882.

## CLARK UNIVERSITY, MEDICAL DEPARTMENT.

WORCESTER, Mass. G. STANLEY HALL, Ph. D., LL. D., President.

CHARTERED 1887.

The officers of instruction are four professors, three assistant professors, one adjunct professor, one instructor, ten docents, two honorary fellows, seventeen fellows and four assistants.

None but graduate students are admitted to the course of the University. At present no entrance examinations are required, but a candidate for admission must show by testimonials, diplomas, personal interviews, or specially written specimens of work that he has scholarship enough to work to advantage, and zeal and ability enough to devote himself to original research in his chosen field.

It is highly desirable, and will probably before long be required, that candidates for admission have also a reading knowledge of French and German.

---

\*Not including one graduate who matriculated.

†These four institutions were organized under the "Public statutes, chapter 115, relating to associations for charitable, educational and other purposes." The act of June 30, 1883, forbade such corporations conferring medical degrees without special authorization by the legislature. This exposure of the character of these so-called medical schools by the ILLINOIS STATE BOARD OF HEALTH resulted in the above legislation and their virtual extinction.

The Medical Department of the University is not an institution for conferring the degree of M. D., but one in which graduates in medicine and college graduates intending to study medicine may study the purely scientific parts of medicine, such as chemistry, biology, anatomy, physiology, neurology, experimental psychology and anthropology.

Facilities for clinical instruction and hospital work, which commonly constitute the latter part of a medical course, are not yet offered in this University.

"The most important part of our work is research, and we wish soon to be ready to be chiefly judged by the value of our contributions to the sum of human knowledge. By the unanimous vote of the board of trustees, approved by a unanimous vote of the faculty, the leading consideration in all engagements, re-appointments, and promotions, must be the quality and quantity of successful investigation. This significant step gives us a unique character, and makes most of our problems new ones. \* \* \* \* We duplicate almost nothing in other universities in this country."

**FEES:** The charge for instruction, giving all the privileges of the University, but not covering laboratory fees, is \$200 per annum. Scholarships and fellowships are open only to students in one or more of the five departments, and are designed to encourage promising young men to attain great proficiency in the lines of study they prefer.

## MICHIGAN.

### DEPARTMENT OF MEDICINE AND SURGERY OF THE UNIVERSITY OF MICHIGAN.

ANN ARBOR, Mich. W. A. CAMPBELL, M. D., Secretary.

**ORGANIZED** in 1850. The first class was graduated in 1851. Classes have been graduated each subsequent year.

The faculty consists of ten professors, five assistant professors, five lecturers, four instructors and one assistant in chemistry.

**COURSE OF INSTRUCTION:** The forty-first annual session began October 1, 1889, and will end the last of June, 1890, continuing nine months, and being divided into two semesters. At the end of each semester written examinations are held. **The course of study is graded and extends over four years.** Women admitted upon the same terms as men.

Lectures embrace: First year—Osteology, materia medica, chemistry—analytical, general and qualitative; physics, descriptive anatomy, pharmacy and pharmacognosy. Second year—Hygiene, histology, anatomy—descriptive and practical, therapeutics, toxicology, materia medica, chemistry—general, qualitative, organic and physiological; physiology and electro-therapeutics. Third year—Theory and practice, surgery, diseases of children, diseases of women and obstetrics, physiology, medical jurisprudence, meteorology and climatology, embryology, dermatology, analysis of urine, practical pathology, practical hygiene and practical anatomy. Fourth year—Theory and practice, surgery, diseases of women and obstetrics, diseases of children, ophthalmology, pathology, diseases of the nervous system and insanity, laryngology and otology, pathology, surgical anatomy, physical diagnosis, clinics and hospital practice.

**REQUIREMENTS:** For admission—1) Eighteen years of age; 2) good moral character; 3) "matriculants in a regular course in the Literary Department of the University, graduates of literary colleges of good standing, graduates of schools approved as diploma schools in the Literary Department, and of other high schools of equal standing, will be admitted without examination on presentation of proper evidence." For all others the requirements for admission are as follows:

1—"A competent knowledge of arithmetic, spelling, grammar, the art of composition, and a respectable acquaintance with English literature, such, for instance, as may be acquired by the study of Shaw's Manual of English Literature, or other similar work.

2—"A competent knowledge of political and physical geography, such as is contained in advanced school geographies, and in Guyot's Physical Geography."

3—"An outline of the history of modern civilized nations, and especially of American history, such as may be found in the manuals of history used as text-books in high schools."

4—"A competent knowledge of elementary zoology, including an acquaintance with the characteristics of the principal divisions of the animal kingdom. Packard's Zoology may be cited as an illustration of a work to be studied."

"The above requirements are all that are insisted upon for the next two years. After the year '92 such a knowledge of the Latin language will be required as will enable the applicant to read and write correctly current or ordinary prescriptions, and appreciate the technical language of the natural sciences and of medicine, and such a knowledge of elementary physics as is given in a high school course. It is also considered highly desirable, but not required, that they have a general grammatical acquaintance with the German and French languages. A similar acquaintance with Greek will also be serviceable to the student and is highly recommended."



"Students who have studied medicine elsewhere at least one year, may be admitted to advanced standing after having passed a satisfactory examination on all the studies which have already been pursued by the class to which they seek admission."

For graduation, "To be admitted to the degree of Doctor of Medicine, a student must be twenty-one years of age and possess a good moral character; he must have completed the required course in laboratory work, and unless the full course of study has been taken in this college, he must have been engaged in the study of medicine for the period of **four years**, including the time spent in attendance upon lectures. He must also have passed satisfactory examinations on all the studies included in the full course of instruction; or if admitted to advanced standing he must have attended at least three full courses of medical lectures, two of which must be in this college, and must have passed the required examinations." In consequence of the prominence given to written examinations through the course no graduating thesis is required.

**FEES:** Matriculation, for residents of Michigan, \$10; for non-residents, \$25, to be paid but once; lectures, for residents of Michigan, \$25; for non-residents, \$35; graduation, for all alike, \$10; demonstrator, \$20; laboratory, \$20.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	380	99	26.
1881-82	380	90	23.7
1882-83	366	117	32.
1883-84	328	85	25.9
1884-85	334	80	23.9
1885-86	325	83	25.5
1886-87	321	81	25.2
1887-88	309	65	21+
1888-89	365	80	21.9
1889-90	369	88	23.8

Percentage of graduates to matriculates for past ten years 24.9.

#### DETROIT MEDICAL COLLEGE.

DETROIT, Mich.

ORGANIZED in 1868.—Extinct in 1885. See *Detroit College of Medicine*.

#### DETROIT HOMEOPATHIC MEDICAL COLLEGE.

DETROIT, Mich.

ORGANIZED in 1871.—Extinct since 1876.

#### MICHIGAN HOMEOPATHIC MEDICAL COLLEGE.

LANSING, Mich.

ORGANIZED in 1872.—Extinct, 1873.

#### HOMEOPATHIC MEDICAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

ANN ARBOR, Mich. JAMES C. WOOD, M. D., Secretary of the Faculty.

ORGANIZED in 1875. The first class was graduated in 1877. Classes have been graduated each subsequent year.

The faculty consists of five professors and four assistants to chairs; seven professors of the department of medicine and surgery (regular school) give instructions to homeopathic students: three in department of science, two in department of law.

**COURSE OF INSTRUCTION:** One annual session; that of 1890-91 began October 1, 1890, and will end the last of June, 1891. The course is graded, extending over three years, although two courses *may* suffice under certain conditions (see requirements for graduation.) Daily quizzes by the assistants of the several chairs. Women admitted upon the same terms as men.

Lectures as follows: The first year of the course will include anatomy, histology, general chemistry, osteology, embryology, microscopy, sanitary science, minor surgery, materia medica, principles of medicine, preparation of medicines and their action, descriptive and anatomical botany, clinics, physical diagnosis, with the

necessary practical work in the chemical and physiological laboratories. This year's work in materia medica will be devoted to teaching the source, nature, origin and method of preparing remedies, with their physiological action, and a general survey of their pathogeneses. In the second year the above studies, including histology and minor surgery, will be reviewed, and the student will take up general and special therapeutics, in connection with materia medica, diseases of women and children, with clinical work, materia medica, qualitative chemistry and analysis of urine, pathological anatomy, principles and practice of medicine (including hygiene or preventive medicine), principles of surgery, and ophthalmology and otology. The materia medica work of this year will consist of special analyses and syntheses of drug-provings. In addition, the student will attend such didactic and clinical lectures on the practical branches as his progress shall render advisable. Demonstrations in operations in surgery are required, and lectures on the institutes of homeopathy, including the *Organon* of Samuel Hahnemann, must be attended. In the third year the student will enter upon the study of operative surgery, electro-therapeutics, spinal diseases and curvatures and review obstetrics, materia medica, diseases of women and children, the principles and practice of medicine, and ophthalmology and otology, and receive practical instruction in diagnosis and treatment, both theoretical and clinical, and in pathology.

**REQUIREMENTS:** For admission: 1) eighteen years of age and good moral character, and must have sufficient primary education to make good use of the advantages offered; 2) students who are graduates of some accredited college, academy or high school, or who possess a teacher's certificate, qualifying them to teach in the common schools of the State in which they reside, will be admitted upon presentation of such certificate; 3) lacking this, must submit to an examination in writing in the branches of a common school English education. Students who have studied elsewhere at least one college year, and who possess superior qualifications, may be admitted, on examination, to advanced standing. Matriculating examination was held September 30, 1890.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) must have successfully pursued the study of medicine in some accredited college for the period of three years, the last of which must have been in this college; 4) must have attended at least seventy-five per cent. of the regular lectures; 5) must have spent the required time in practical anatomy, chemical analysis, etc., in the various laboratories and hospitals; 6) must have attended the usual quizzes and drills by the assistants of the several chairs; 7) must also have passed satisfactory examinations in all the studies included in the curriculum. Students who have completed full college courses for the first and second years in an accredited medical college will be permitted, upon examination, to enter the third year and complete the studies of that year in this department, and to present themselves for examination for the degree at the end of the year. Time certificates from the Secretary of the Faculty of medicine showing lectures attended are required.

### **See educational and graduation requirements of the American Institute of Homeopathy in 1892. Introductory remarks, this REPORT.**

**FEES:** Matriculation, for residents of Michigan, \$10; for non-residents, \$25, (paid but once). Lectures, for residents of Michigan, \$25; for non-residents, \$35. Graduation, for all alike, \$10. Courses in chemical laboratory, \$20; in histological laboratory, \$5; in electro-therapeutics, \$1; in anatomy, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	88	23	26.
1881-82	71	15	21+
1882-83	57	17	29.
1883-84	55	20	36.3
1884-85	34	6	17.6
1885-86	49	17	34.7
1886-87	60	14	23.3
1887-88	73	13	17.8
1888-89	72	21	29.1
1889-90	71	21	29.5

Percentage of graduates to matriculates for past ten years, 26.5

### **MICHIGAN COLLEGE OF MEDICINE.**

DETROIT, Mich.

ORGANIZED in 1880.—Extinct in 1885. See *Detroit College of Medicine*.

### **DETROIT COLLEGE OF MEDICINE.**

DETROIT, Mich. E. C. SKINNER, M. D., Secretary, the College Building.

ORGANIZED in 1885 by the consolidation of the Detroit Medical College and the Michigan College of Medicine, and incorporated by act of Legislature, June, 1885.

The faculty consists of twenty-two professors, eight assistants, two lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** The regular session began September 24, 1890, and will continue six months. The spring session will begin April 1, and close June 10, 1891; attendance on this course is optional.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, and gynecology, otology, ophthalmology, dermatology, laryngology, clinical medicine and surgery, genito-urinary diseases, dental surgery, diseases of children and orthopedic surgery, mental and nervous diseases, microscopy, histology and bacteriology.

**REQUIREMENTS:** For admission—"All matriculates of the Detroit College of Medicine will be required to show, on examination, a satisfactory knowledge of the English branches. In place of this examination the college will accept the degree of A. B., B. S., Ph. D., certificates of having passed the entrance examination of any incorporated literary college, or any recognized medical college in which an examination is required for admission; also certificates of having graduated at any high school or academy."

For graduation: 1) evidence of good moral character; 2) twenty-one years of age; 3) three years' study of medicine completed; 4) **three full courses** of lectures; 5) dissected every part of the cadaver; 6) a satisfactory course of practical work in the chemical and physiological laboratories; 7) practical clinical work for one term in hospital and out-door clinics; 8) a final examination.

**FEES:** Matriculation, \$5; lectures, \$50; hospital, \$10; graduation, \$30; single tickets, \$15, each branch; spring term, \$10; perpetual ticket, \$100; fee for practical work in the chemical or physiological laboratory, \$5 per month, each; histological and bacteriological laboratory, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1885-86	116	46	39.6
1886-87	110	33	30.
1887-88	129	30	23.2
1888-89	131	43	32.8
1889-90	138*	36	26+

Percentage of graduates to matriculates for past five years, 30.1.

**"Candidates for graduation, session 1890-91, must present satisfactory evidence of having attended three full courses of lectures."**

## MICHIGAN COLLEGE OF MEDICINE AND SURGERY.

DETROIT, Mich. J. W. HAMLEN, M. D., Secretary, 79 High street, east.

ORGANIZED in 1888.

The faculty consists of twelve professors, three assistants, one demonstrator and three lecturers.

**COURSE OF INSTRUCTION:** The second course of lectures began on Tuesday, September 16, 1890, and will continue six months. This will be followed by a spring course commencing the third Tuesday in March, and closing the third Friday in May, 1891. Three years' graded course recommended, but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, surgery, pathology, theory and practice of medicine, obstetrics, diseases of children, ophthalmology, laryngology, histology, venereal diseases, hygiene, gynecology, otology, microscopy, clinical and military surgery and medical jurisprudence.

**REQUIREMENTS:** For admission—1) diploma from a literary or scientific college or high school, or a first-grade teacher's certificate; 2) lacking these an examination in the branches of a good English education.

For graduation—1) twenty-one years of age and of good moral character; 2) three years' study of medicine; 3) two full courses of lectures; 4) satisfactory examination

**FEES:** Matriculation, \$5; lectures, \$50; graduation, \$25; spring course, \$10; perpetual ticket, \$100.

---

\* Not including four graduates who matriculated.

STUDENTS: Number of matriculates and of graduates, as reported.

Session.	Matriculates.	Graduates.	Percent.
1888-89	48	11	22.9
1889-90	74	18	24.3

Percentage of graduates to matriculates for the two years reported, 23.7.

**Beginning with session 1891-92 four years' study and at least three courses of lectures of six months each will be required for graduation.**

## MINNESOTA.

### STATE MEDICAL EXAMINING BOARD OF MINNESOTA.

ARTHUR SWEENEY, M. D., Secretary. ST. PAUL, Minnesota.

The first report of this Board issued November 26, 1888, showed that there were in Minnesota 1,291 practitioners of medicine, 834 being physicians, 151 homeopaths, 41 eclectics and 263 unclassified (persons not graduates, but having *pro forma* certificates on account of practice in the state prior to the passage of medical laws.) Under the act of 1883, which granted licenses on presentation of diplomas and which exacted examinations only from non-graduates, 151 licenses were issued during the year from July 1, 1885 to July 1, 1886, and 278 were issued from July 1, 1886, to July 1, 1887, making a total for the two years of 429. Under the law of 1887, which is now in force, 223 candidates have applied for examination, of whom 138 have been licensed and 85 rejected—the percentage of rejections being 38.08. The small number of applications for examination is due in a large measure to that provision of the law which requires that applicants who graduated later than July 1, 1887, **"must present evidence of having attended three courses of lectures of at least six months each."** This has in a great degree kept from Minnesota graduates of short-term medical colleges.

The official Register of Physicians shows that there are in Minnesota 1,191 practitioners of medicine, of whom 548 are physicians, 156 homeopaths, 38 eclectics and 149 unclassified. The number of "unclassified" practitioners has diminished from 351 in 1883 to 263 in 1888, and to 149 in 1890. This is due to the fact that the advent of a better educated class of practitioners has driven from the state those irregulars whom the former law permitted to practice without regard to their qualifications.

During the past three years the Board has revoked three licenses, one for drunkenness while in attendance on a person dangerously ill, and two for having presented forged diplomas, and fraudulently obtaining licenses to practice.

The Board holds meetings for examination of applicants at the state capitol in St. Paul on the first Tuesdays of January, April, July, and October. No diplomas are recognized by the Board, and all candidates must pass a written examination, lasting two and one-half days, in the following subjects: Practice of medicine, surgery, obstetrics, diseases of women and children, materia medica and therapeutics, anatomy, physiology, chemistry and toxicology, diseases of the nervous system, ophthalmology, otology, preventive medicine, medical jurisprudence, pathology and histology.

The rules and regulations governing examinations are as follows:

I.—Any applicant for examination and license to practice medicine in this state, who is a graduate of *over five years* standing before making application for such examination and license, shall be considered an "old practitioner", and any such applicant who is a graduate of *less than five years* shall be considered a "recent graduate."

II.—Applicants who are "old practitioners" shall be required to obtain a minimum marking of not less than *sixty-five* per cent. in each of the following subjects: 1 Practice of Medicine, 2 Practice of Surgery, 3 Materia Medica, 4 Obstetrics and Diseases of Women and Children, and a minimum marking of not less than *thirty-five* per cent. in each of the following subjects: 1 Anatomy, 2 Chemistry, 3 Physiology, 4 Pathology, Histology, and Preventive Medicine, 5 Diseases of the Eye and Ear, 6 Medical Jurisprudence.

III.—Applicants who are "recent graduates" shall be required to receive a minimum marking of *sixty-five* per cent. in: 1 Practice of Medicine, 2 Practice of Surgery, 3 Materia Medica, 4 Obstetrics and Diseases of Women and Children; and a minimum marking of not less than *fifty* per cent. in each of the following: 1 Anatomy, 2 Chemistry, 3 Physiology, 4 Pathology, Histology, and Preventive Medicine, 5 Diseases of the Eye and Ear, 6 Medical Jurisprudence.

IV.—No applicant shall be issued a license whose general average in all the subjects in which he is examined by this Board is less than *sixty-five* per cent., one hundred being the highest average possible for any applicant to obtain.

V.—Each applicant shall register his or her name opposite a number in a book kept by the Secretary for that purpose, and shall mark his or her papers with said number, and shall be known to the members of this Board only by said number until his or her papers have been examined and marked.

VI.—The marks placed upon papers examined may range from one hundred, the maximum, to zero, the minimum.

VII.—Any applicant failing to pass an examination satisfactory to this Board, and being refused a license, may present himself or herself at any subsequent regular meeting of said Board and receive another examination.

VIII.—All examinations shall be in writing, but may, at the discretion of the Board, be supplemented by an oral examination before the Board in those subjects in which applicants have failed to pass an examination satisfactory to the Board.

INSTITUTIONS REPRESENTED BY THE APPLICANTS BEFORE THE STATE BOARD OF MEDICAL EXAMINERS OF MINNESOTA.	Number of Applicants, each College.	Licenses Issued	Licenses Refused	Number applying for Re-examination	Rejected on 2d exami- nation	Rejected on 3d exami- nation
Non-graduates.	5	5	2	1	1	
Department of Medicine and Surgery, University of Michigan, Ann Arbor, Michigan.	28	26	2	1	1	
Harvard University Medical School, Boston, Mass.	5	5				
Rush Medical College, Chicago, Ill.	14	7	7	3	2	
Medical Department, University of Minnesota, Minneapolis, Minn.	24	16	8	5	2	
Homeopathic Medical Department, University of Minnesota, Min- neapolis	6	2	4	2	1	
Chicago Medical College, Chicago, Ill.	9	8	1	1		
College of Physicians and Surgeons of Chicago, Chicago.	4	3	1	1		
Chicago Homeopathic Medical College, Chicago.	2	1	1			
Hahnemann Medical College, Chicago.	3	2	1			
University of Pennsylvania, Department of Medicine, Philadelphia	12	10	2	2		
Jefferson Medical College, Philadelphia	3	3				
Hahnemann Medical College, Philadelphia.	3	2	1	1		
McGill University, Faculty of Medicine, Montreal, Quebec	5	5	3	2		
Medical School of Maine at Bowdoin College, Brunswick, Maine.	5	5	2	1		
Dartmouth Medical College, Hanover, New Hampshire.	1	1				
Bennett College of Eclectic Medicine and Surgery, Chicago, Ill.	6	1	5	2	1	
University of Manitoba, Winnipeg, Manitoba.	1	1				
Medical Department, State University of Iowa, Iowa City, Iowa.	3	1	2	1	1	
Kentucky School of Medicine, Louisville, Kentucky.	4	4	4	1	1	1
College of Physicians and Surgeons in the City of New York.	4	4				
Royal Frederiks University, Christiania, Norway.	3	3				
University of Berlin, Germany.	3	2	1			
University of Utrecht, Holland.	1	1	1			
Woman's Medical College of the New York Infirmary, New York City.	2	2				
Detroit Medical College, Detroit, Michigan.	2	2				
Homeopathic Hospital College, Cleveland, Ohio.	4	1	3	2	1	1
St. Paul Medical College, St. Paul, Minnesota.	2	1	1	1		
Albany Medical College, Albany, New York.	1	1				
Royal College of Physicians and Surgeons, Dublin, Ireland.	1	1				
Boston University School of Medicine, Boston, Mass.	1	1				
Medical College of Indiana, Indianapolis, Indiana	5	1	5	3	3	1
Eclectic Medical Institute, Cincinnati, Ohio.	1	1				
College of Physicians and Surgeons, Keokuk, Iowa.	1	1				
Medical Department of Queen's University, Kingston, Canada	7	4	3	1	1	
Missouri Medical College, St. Louis, Missouri.	3	1	2			
Medical Department, University of Vermont, Burlington Vermont	1	1				
University of Copenhagen, Denmark.	1	1				
University of the City of New York, Medical Department.	3	2	1			
Long Island College Hospital, Brooklyn, New York.	1	1				
University of Trinity College, Toronto, Canada.	2	2				
Bellevue Hospital Medical College, New York City.	3	2	1			
New York Homeopathic Medical College, New York City.	2	1	1	1		
Royal Karolinska Mediko-Kirurgiska Institutet, Stockholm, Sweden	1	1	1			
University of Upsala, Sweden.	1	1				
College of Medicine of Syracuse University, Syracuse, New York.	2	1	1			
Medical Department, University of Wooster, Cleveland Ohio.	2	1	1	1		
Medical Department, University of Victoria, Canada.	1	1	1			
Minneapolis College of Physicians and Surgeons, Minneapolis, Minnesota.	2	1	1			
Woman's Medical College of Pennsylvania, Philadelphia.	1	1				
University of Bucharest, Roumania.	1	1				
Minnesota Hospital College, Minnesota.	1	1				
Western Reserve University, Medical Department, Cleveland, O.	1	1				
Medical College of Ohio, Cincinnati, Ohio	1	1				
Medical Department of the University of Buffalo, Buffalo, N. Y.	1	1	1			
Incomplete examinations.	5		5			
Totals	223	138	85	32	16	4

## WINONA MEDICAL SCHOOL.

WINONA, Minn.

ORGANIZED in 1872.—Extinct. No diplomas were issued. It was a school of instruction only.

## MINNESOTA HOSPITAL COLLEGE.

MINNEAPOLIS, Minn.

ORGANIZED in 1881, as the successor of the St. Paul Medical College, founded in 1878. Reorganized in 1885 under its present title. Merged into the Medical Department of the University of Minnesota in 1888.

## MINNEAPOLIS COLLEGE OF PHYSICIANS AND SURGEONS.

MINNEAPOLIS, Minn. J. T. MOORE, M. D., Dean, 24 Washington avenue, South.

ORGANIZED in 1883.

The faculty consists of sixteen professors, two adjuncts, two instructors and a demonstrator of anatomy.

COURSE OF INSTRUCTION: The session of 1890-91 began September 23, 1890, and will end April 5, 1891. **Three years' graded course obligatory**, whereby two courses of lectures on each branch is required. Women admitted upon same terms as men.

Lectures embrace: First year—Anatomy, descriptive and surgical; physiology; chemistry, theoretical and practical; materia medica, including botany; diseases of children, obstetrics. Second year—Anatomy, descriptive and surgical; pathology and histology, physiology; chemistry, theoretical and practical; materia medica; medicine, theoretical and clinical; surgery, theoretical, operative and clinical; gynecology, theoretical and clinical. Third year—Medicine, theoretical and clinical; surgery, theoretical and clinical; gynecology, theoretical and clinical; obstetrics, theoretical and clinical; pathology and histology; diseases of children; ophthalmology and otology; laryngology; preventive medicine; medical jurisprudence; genito-urinary diseases; orthopedic surgery.

REGULATIONS AND REQUIREMENTS: "Preliminary examination. This will be required of all students before matriculation. \* \* \* The examination shall consist of (a) English language, including grammar and composition (this shall include spelling, writing, grammatical construction of sentences, and derivation of words in common use); (b) United States history, or history of applicant's native country; (c) modern geography; (d) elements in mathematics; (e) Latin, medical (optional, to be passed at any time before the final examination)." "Satisfactory evidence of having passed a similar examination before any authorized body, will be accepted in lieu of the above."

For graduation: 1) **attendance on three courses of lectures, of six month each**, the last one, at least, in this college; 2) certificates of attendance must be shown that students have attended eighty-five per cent. of all lectures on every branch taught; 3) attendance two winters upon practical anatomy; and, of at least having gone over one lateral half of the human body; 4) attendance two winters upon clinical instructions; 5) attendance upon two obstetrical cases; 6) pass examination, written and oral, for degree of Doctor of Medicine and Mastery of Surgery.

This college has established an obstetrical course, comprising two sessions of six months each, in the following branches, viz.: anatomy of the pelvis, and pelvic viscera, physiology, materia medica and obstetrics; examinations for a certificate of this special school are held at termination of second session of attendance. These lectures are given for the benefit of midwives desiring to take the special examination adopted by the Board of Medical Examiners of the State of Minnesota.

FEES: Matriculation, \$5; demonstrator's ticket, \$5; lecturer's fees (full course), \$40, long term, \$80; final examination, \$10. Students having paid fee in full for two years are admitted to third year upon payment of matriculation fee only. Fees for special obstetrical course, \$25, each session.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	9	1	11.1
1884-85	8	2	25.
1885-86	12	3	25.
1886-87	13	1	7.6
1887-88	8	2	25.
1888-89	10	1	10.
1889-90	17	5	29.4.

Percentage of graduates to matriculates for past seven years, 19.4.

## ST. PAUL MEDICAL COLLEGE.

St. PAUL, Minn.

ORGANIZED in 1885. A reorganization of the school of the same name founded in 1878, but associated with the Minnesota Hospital College in 1880 to 1885. Merged into the Medical Department of the University of Minnesota in 1888.

## MINNESOTA HOMEOPATHIC MEDICAL COLLEGE.

MINNEAPOLIS, Minn.

ORGANIZED in 1886. Held two courses of lectures, and, in 1888, was merged into the Homeopathic Medical Department of the University of Minnesota.

## THE COLLEGE OF MEDICINE AND SURGERY.

(*Medical Department of the University of Minnesota.*)

MINNEAPOLIS, Minn. PERRY H. MILLARD, M. D., Dean of the Department of Medicine.

ORGANIZED in 1883. The faculty was limited to the examination of applicants for the degrees of M. B. and M. D. Reorganized in 1888—under a new medical law passed by the legislature of 1886, absorbing the Minnesota Hospital College and the St. Paul Medical College.

The faculty consists of twenty-three professors, three adjunct professors and a demonstrator and two clinical professors.

**COURSE OF INSTRUCTION:** One annual lecture term of eight months. That of 1890-91 began October 6, 1890, and will continue eight months. This is the essential part of the college year and consists of didactic lectures, practical demonstrations, laboratory work and clinical teaching in the lecture rooms and in the dispensaries and hospitals. Frequent class examinations, or "quizzes," will be conducted by each professor and are considered an important feature of the course. Attendance upon at least four-fifths of the lectures under each chair is requisite in order to entitle the student to enter for final examination or to a certificate of attendance. **Graded course extending over three years required.** Where practicable students are requested to take four courses of lectures. Women admitted upon same terms as men.

**Lectures embrace:** First year, anatomy, chemistry, histology, physiology, materia medica, laboratory work; second year, continuation of first years' studies, and pathology, medical jurisprudence, theory and practice, clinical medicine, obstetrics, diseases of children, physical diagnosis, hygiene, surgery, clinical surgery, gynecology, clinical instruction; third year, continuation of second year studies (without those of the first year), therapeutics, neurology, ophthalmology, dermatology, laryngology, electro-therapy, otology, genito-urinary diseases, orthopædia, clinical instruction in all branches, and bacteriology, dissecting is regarded as advanced work, and is only done in the second year.

**REQUIREMENTS:** For admission: applicants for admission to the College of Medicine and Surgery will be required to prove their fitness to enter the college: 1) by writing legibly and correctly an English composition of not less than two hundred words; 2) by translation of easy Latin prose, or, in lieu thereof, by passing an examination upon one of the following subjects: French, German or one of the Scandinavian languages; 3) by passing an examination upon either the elements of algebra, plane geometry, or botany; 4) by showing such a knowledge of physics as may be obtained from the study of Gage's, Avery's or Balfour Stewart's Elements of Physics. It is provided, however, that no examination for admission shall be required of matriculates or graduates of any reputable college of science, literature and arts; of graduates of high schools of the first-grade. Students from other colleges may be admitted, however, to the second year of lectures in the college which corresponds to their previous course of study, by furnishing evidence, 1) of their possession of the specified preliminary education or its alternatives; 2) of the prosecution of their medical studies for one year; and 3) of attendance upon one full course of lectures

in some recognized college of medicine. Admission may, similarly, be gained to the senior year by furnishing evidence, 1) of the necessary preliminary qualification; 2) of the continuance of their professional studies for two years; and 3) of attendance upon two full courses of instruction in some recognized medical college, and finally, by sustaining satisfactory examinations, or giving evidence of having already successfully passed examinations in the studies of the first and second years.

**For graduation:** Candidates for graduation and for the degrees conferred by the university upon graduates of the college, must possess the following qualifications: 1) they must be upwards of twenty-one years of age; 2) they must be of good moral character; 3) they must have spent three full years in the study of medicine; 4) they must have attended **three full courses of lectures**, the last of which, at least, must have been in this university, and the two former in this or some other recognized university or college of medicine; and, 5) they must have sustained satisfactory examinations in the various branches of study, in accordance with the rules of the general faculty.

**Fees:** Matriculation, (annually) for residents of Minnesota, \$10; for others \$25; lectures, (annually) for residents of Minnesota, \$25; for others \$35; graduation, \$10; material for dissection, \$10 per part.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1888-89	75	16	21.3
1889-90	87	15	18.3

Percentage of graduates to matriculates for past two years, 19.1.

**After the session of 1890-91 four years of study will be required.**

### COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY.

(*Homeopathic Medical Department of the University of Minnesota.*)

MINNEAPOLIS, Minn. PERRY H. MILLARD, M. D., Dean of the Department of Medicine.

ORGANIZED in 1888, absorbing the Minnesota Homeopathic Medical College.

The faculty consists of nineteen professors, one adjunct professor and one demonstrator.

**COURSE OF INSTRUCTION:** Same as the College of Medicine and Surgery.

**Lectures embrace:** First year—Anatomy, physiology, chemistry, materia medica, histology. Second year—anatomy, physiology, chemistry and toxicology, materia medica, theory and practice, clinical medical, obstetrics surgery and clinical surgery, gynecology, physical diagnosis, pathology, hygiene, pædology, ophthalmology, mental and nervous diseases, medical jurisprudence and genito-urinary diseases. Third year—As the second year, without the three first studies, and in addition, otology and rhinology, dermatology and venereal diseases, orthopædia, laryngology and electro-therapy.

**REQUIREMENTS:** For admission and graduation, same as the College of Medicine and Surgery.

**FEES:** Same as the College of Medicine and Surgery.

Session.	Matriculates.	Graduates.	Percent.
1888-89	13	4	30.7
1889-90	8	1	12.5

Percentage of graduates to matriculates for past two years, 23.8.

**After the session of 1890-91 four years of study will be required.**

## MISSOURI.

### STATE BOARD OF HEALTH OF MISSOURI.

ST. LOUIS, Mo. GEO. HOMAN, M. D., Secretary.

REORGANIZED July 2, 1885, having been then in existence two years. The provisions of the law creating the Board and defining its duties and powers are, in all material points, the same as those in Illinois. The standard of recognition of medical colleges as being in good standing is the same as that established by the Illinois Board.

Since the reorganization no licenses have been given to exempt non-graduates; only graduates fulfilling the requirements have received certificates, with the exception of a few applicants who succeeded in passing the examinations. For reasons existing no great degree of encouragement has been extended to those seeking license in this way, the course advised being that they should prepare themselves in, and be duly vouched for as to fitness, by accredited medical schools before coming to the Board for official recognition and license.



The possession by the Board of delegated power and the obligation of its judicious exercise in the regulation of medical practice, the licensing of practitioners, the refusal to issue certificates to those guilty of unprofessional or dishonorable conduct, and the revocation of certificates for like cause, was fully sustained and confirmed by the Supreme Court of the State in a decision rendered in December, 1884. In the exercise of its discretion in the determination of what shall be held to constitute unprofessional or dishonorable conduct in physicians, the Board is declared to be beyond the reach of mandatory authority; and the same view is affirmed with regard to its power to deal with medical colleges, provided no element of discrimination in favor of or against particular systems or schools, legalized by the State, enters into its decision.

Since the creation of the Board 4,445 certificates have been issued to graduated physicians; 979 to exempt non-graduates; 26 upon examinations; and 580 to midwives, most of whom were graduates.

From and after the spring session of 1890 to secure recognition of their diplomas, midwifery schools must require attendance at two terms of three months each with enlarged course of study.

**"The Board has under consideration and contemplates the early adoption of the requirement of three annual graded courses of lectures and four years of study by medical colleges."**

During 1890 some 400 physicians and 20 midwives were licensed; a considerable number of applications were declined for the reasons authorizing such action, and the certificates of two practitioners were revoked for unprofessional or dishonorable conduct.

### MISSOURI MEDICAL COLLEGE.

ST. LOUIS, MO. P. GERVAIS ROBINSON, M. D., LL. D., Dean, 3411 Washington ave.

ORGANIZED in 1840 as the Medical Department of Kemper College. In 1845 it became the Medical Department of the University of the State of Missouri. In 1855 it became the Missouri Medical College.

The first class was graduated in 1841. It was suspended during the war, and no students were graduated in 1862, '63, '64 or '65. It is sometimes called, after its founder, The McDowell Medical College.

This college has recently absorbed the St. Louis Post-Graduate School of Medicine, adding several of the members of that school to its faculty, increasing very materially the facilities for lectures and clinical instruction. Its building, which is claimed to be the finest structure of its kind in this country, will be used for the senior classes of the under-graduate department, and also for post-graduate classes.

The faculty consists of fifteen professors, three clinical professors, three chiefs of clinic, two instructors, one adjunct professor, one demonstrator, one assistant demonstrator and fifteen clinical assistants.

**COURSE OF INSTRUCTION:** The fiftieth regular graduating course began September 30, 1890, and will continue six months; the spring course will begin April 6, 1891, and continue until June 1. This course will consist of clinics and didactic lectures. **A three years' graded course is required.** Clinics are given at hospitals and dispensary.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology, otology, histology, biology, clinical medicine, clinical surgery, diseases of the nervous system, diseases of children, pharmacy and microscopy, laryngology, dermatology and toxicology.

**REQUIREMENTS:** For admission: "A preliminary examination is required as a condition of admission to the regular winter course of lectures. This examination will be held at the beginning of the winter or spring term, as the student enters. It will embrace the branches of a good English education, such as are taught in the public schools, namely: mathematics, elementary principles of physics and English composition.

Gentlemen who are graduates of a literary or scientific college, academy, or high school, or who have passed the entrance examination of a literary college in good standing; those who have a county or state teacher's certificate; graduates in medicine; and students taking lectures for a special purpose other than securing the degree, will be exempt from this examination." **Students attending their first course of lectures during this session, will be required to attend three regular terms of six months each.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three full courses of lectures** and attendance upon clinics and dissections so long as a student of this college; 4) satisfactory examination.

**FEES:** Matriculation, \$5; lectures, \$60; course in chemistry or biology, laboratory fee, \$10; single tickets, \$10 each branch; graduation, \$30; demonstrator, \$10; spring course, \$20.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	265	123	46.4
1881-82	235	125	53
1882-83	210	86	41
1883-84	252	103	40.8
1884-85	208	88	42.3
1885-86	221	86	38.9
1886-87	205	91	44.3
1887-88	222	79	35.5
1888-89	248	81	32.6
1889-90	244	100	40.9

Percentage of graduates to matriculates for past ten years 41.6.

**After the session of 1890-91 four years of study will be required as a condition of graduation.**

#### ST. LOUIS MEDICAL COLLEGE.

ST. LOUIS, MO. HENRY H. MUDD, M. D., Dean, 2604 Locust street.

ORGANIZED in 1841, as the Medical Department of the St. Louis University. In 1855 it was chartered as an independent institution under its present name. The first class was graduated in 1843. Classes have been graduated each subsequent year.

The faculty consists of eighteen professors, one adjunct professor, two clinical professors, one assistant professor, three lecturers and six instructors.

**COURSE OF INSTRUCTION:** The forty-ninth annual session began on Tuesday, September 23, 1890, and will close on Friday, May 22, 1891. **The course of study extends over a period of three years, and is graded. Each session is eight months in length.**

The fourth year, (optional advanced course), is open to all students who, having completed the work of the senior year, have passed examination in all the required subjects of the junior and middle years. There is also a course provided for post-graduates.

Lectures embrace chemistry, anatomy, histology, physiology, materia medica, therapeutics, pathology, principles and practice of medicine, principles and practice of surgery, clinical medicine, clinical surgery, obstetrics, hygiene, medical jurisprudence, diseases of women and children, ophthalmology, otology, dermatology, nervous and mental diseases, diseases of the genito-urinary organs and syphilis, laryngology, orthopædic surgery and bacteriology.

**REQUIREMENTS:** For admission: Candidates for admission will be received upon the presentation of a degree in letters or science from a college or scientific school, a certificate of graduation from a high school or of a first grade teacher's certificate; lacking these, must pass an examination upon the usual branches of a good English education. Students who have attended one or two courses of lectures in an accredited regular school of medicine may enter middle or senior class upon passing an examination in the studies of the first and second years.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) **must have attended not less than three regular annual courses of lectures;** 5) satisfactory examination.

**FEES:** Matriculation, (paid once only), \$5; term fee, \$90; laboratory fee, \$10 yearly.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	153	43	28.
1881-82	167	29	17.3
1882-83	134	40	30.
1883-84	112	33	29.4
1884-85	91	20	22.
1885-86	96	18	18.7
1886-87	94	27	28.7
1887-88	58	16	27.5
1888-89	66	16	24.2
1889-90	76	22	28.9

Percentage of graduates to matriculates for the past ten years, 25.2.

The degree of Doctor of Medicine *cum laude* is awarded to fourth year advanced students who, having passed in all the required subjects of the four years, shall have attained to an average of seventy-five per cent; to those who shall have attained to an average of ninety per cent., the degree of *Doctor of Medicine, summa cum laude* is awarded.

**NOTE—This school will, after the session of 1890-91, require four years of study.**

## MEDICAL DEPARTMENT, UNIVERSITY OF MISSOURI.

COLUMBIA, Mo., WOODSON MOSS, Secretary.

FOUNDED in 1845. The first class was graduated in 1846. From 1845 to 1855 the medical department was situated at St. Louis. See Missouri Medical College. Suspended during the civil war. Reorganized in 1872. In 1886 it became by co-operative contract with the Missouri Medical College, Section No. 1, of the Medical Department of the University of the State of Missouri. It recently severed its connection with the Missouri Medical College.

The faculty consists of seven professors, eight lecturers, three assistants and one demonstrator.

**COURSE OF INSTRUCTION:** Graded and extends through three years. Instruction given by lectures, recitations, clinical teaching and practical exercises. The eighteenth annual session commenced September 9, 1890, and will end June 1, 1891.

Lectures embrace: First year, anatomy, osteology and dissecting; physiology, chemistry, normal histology, microscopy, general therapeutics. Second year, anatomy, practical physiology, analysis of urine, microscopy, therapeutics, theory and practice of medicine, surgery and obstetrics. Third year, theory and practice of medicine, clinical medicine, physical diagnosis, surgery, clinical surgery, anatomy, obstetrics, therapeutics, gynecology, diseases of children, bacteria culture, diseases of eye, ear, nose and throat, and sanitary science.

**REQUIREMENTS:** For admission: 1) eighteen years of age; 2) good moral character; 3) "candidates will be examined as to their elementary education and their fitness to pursue properly and profitably the technical study of medicine. The candidate will be asked to give an account of his previous educational advantages, and will be examined on the following: 1) English—an essay of about two hundred and fifty words on some familiar subject, to be announced at the time of the examination; 2) arithmetic; 3) elementary physics; 4) elementary botany; 5) elementary zoology; 6) elementary chemistry."

A student who has passed examinations in the above subjects at any scientific, literary or professional college in good standing, or presents testimonials from the proper officer that he has satisfactorily pursued the course at some high school, academy or preparatory school approved by the faculty, will be excused from the examination.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three courses of medical study, two of which must have been in a recognized medical college and the last of which must have been in this college.** 4) pass the required examinations in all the studies of the three years' course.

**FEES:** Matriculation, (including all tickets for one year), \$50; expenses of laboratories, \$10 to \$15 per year.

## HUMBOLDT MEDICAL COLLEGE.

ST. LOUIS, Mo.

INCORPORATED February 28, 1855, as the St. Louis College of Medicine and Natural Sciences. In 1859 it became the "Humboldt Institute, a German college for the promotion of Natural Sciences and Medicine." In 1866 the name "Humboldt Medical College" was assumed. There were eleven matriculates for the session of 1866-67; four graduates in 1867 and twenty-eight matriculates, and four graduates in 1868. Before the opening of the session of 1869-70 a split occurred in the faculty, a portion of the body organizing the College of Physicians and Surgeons. No lectures were delivered after the session of 1869-70. See previous numbers of this Report.

## HOMEOPATHIC MEDICAL COLLEGE OF MISSOURI.

ST. LOUIS, Mo. S. B. PARSONS, M. D., Dean, 2246 Washington avenue

ORGANIZED originally in 1859; re-organized in 1882. Between the years 1869 and 1881 the following homeopathic colleges were organized in St. Louis, viz: The St. Louis College of Homeopathic Physicians and Surgeons, organized in 1869; held two sessions and suspended after session of 1870-71. The Homeopathic Medical College of St. Louis organized 1873. The Hering Medical College, organized in 1880. In 1880 a portion of the faculty of the Homeopathic Medical College of Missouri seceded and revived the St. Louis College of Homeopathic Physicians and Surgeons, which again held two sessions, but after the session of 1881-82 this college and the Hering were consolidated with the Homeopathic Medical College of Missouri.

The faculty consists of thirteen professors, one lecturer and one demonstrator.

**COURSE OF INSTRUCTION:** The thirty-second annual course of lectures commenced September 18, 1890, and will continue six months. Women admitted upon the same terms as men. Clinics at hospital and at dispensary. **Three graded courses of lectures.**

Lectures embrace anatomy physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology and otology, diseases of the nervous system, pedology, clinical medicine, clinical surgery, histology, neurology, the philosophy of homeopa hy.

**REQUIREMENTS:** For admission: "The applicant must present a certificate of moral character; pass an examination in all the branches of an English education, or furnish evidence of scientific and literary qualifications."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **four years' study;** 4) **three full courses of lectures;** 5) two courses of dissection; 6) satisfactory examination in all the branches taught.

**FEES:** Matriculation, \$5; lectures, \$65; graduation, \$25; demonstrator, \$10. For graded course, three years, in advance, \$150; single tickets, \$10, each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	41	11	27.
1883-84	39	18	48.7
1884-85	32	9	28.1
1885-86	38	17	44.7
1886-87	39	14	35.9
1887-88	40	16	40.
1888-89	38	11	28.9
1889-90	47	24	51.

Percentage of graduates to matriculates for the past eight years, 38.1.

## KANSAS CITY MEDICAL COLLEGE.

KANSAS CITY, MO. E. W. SCHAUFFLER, M. D., President of the Faculty.

ORGANIZED in 1869 as the College of Physicians and Surgeons of Kansas City. The first class was graduated in 1870; classes have been graduated in each subsequent year. The school assumed its present name in 1880.

The faculty consists of thirteen professors, two lecturers, two demonstrators and one instructor, one clinical professor and one clinical instructor.

**COURSE OF INSTRUCTION:** One graduating session annually of six full months; that for 1890-91 began September 16, 1890, and will close March 17, 1891. A three years' graded course is recommended, but not required. Hospital and dispensary clinics are given.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, ophthalmology and otology, histology, urinary chemistry, clinical medicine, clinical surgery, diseases of children, laryngology, dermatology and hygiene.

**REQUIREMENTS:** For admission: 1) good moral character; 2) diploma from a credible literary or medical college, diploma from a high school or a teacher's certificate; or, 3) a preliminary examination in English composition, mathematics and elementary physics will be required.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of instruction; 5) dissection of the whole body; 6) personal and written examination on the seven principal branches of medicine.

**FEES:** Matriculation (paid but once), \$5; lectures, \$50; demonstrator, \$10; graduation \$20; single tickets, \$10 each branch; post-graduate course, six weeks, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	42	12	28.5
1881-82	32	16	50
1882-83	36	12	33.3
1883-84	38	15	39.4
1884-85	29	9	31
1885-86	29	10	34.4
1886-87	36	12	33.3
1887-88	48	20	41.6
1888-89	54	19	35.1
1889-90	65	16	29

Percentage of graduates to matriculates for past ten years, 35.3.

## ST. LOUIS COLLEGE OF HOMEOPATHIC PHYSICIANS AND SURGEONS.

St. Louis, Mo.

ORGANIZED in 1869. Suspended after the session of 1870-71. See *Homeopathic Medical College of Missouri*.

## ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS.

St. Louis, Mo. ALGERNON S. BARNES, M. D., Dean, 3013 Easton ave.

ORGANIZED in 1869, and in active operation until 1873, when it became extinct. Organized under its present management in 1879.

The faculty consists of fourteen professors, one demonstrator and one assistant demonstrator.

COURSE OF INSTRUCTION: The regular annual session began September 10, 1890, and will close March 10, 1891. A three years' graded course is recommended, but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, military surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology and otology, dermatology and syphilis, laryngology, clinical medicine, clinical surgery, toxicology, diseases of the nervous system, genito-urinary surgery, diseases of children and histology.

REQUIREMENTS: For admission—1) diploma of graduation from a good literary and scientific college or high school, or a first-grade teacher's certificate; or lacking this, a thorough examination in the branches of a good English education, including mathematics, English composition and elementary physics or natural philosophy; 2) not less than eighteen years of age; 3) credible evidence of good moral character.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) at least three years' study of medicine; 4) attendance on two courses of lectures.

FEES: Matriculation (paid once only), \$5; lecture tickets (including demonstrator's fees), \$50; examination fee (not returnable), \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	41	9	21.9
1881-82	49	12	24.5
1882-83	69	31	45
1883-84	57	27	47.3
1884-85	33	12	36.3
1885-86	35	17	48.5
1886-87	56	21	37.5
1887-88	90	34	37.7
1888-89	148	54	37.7
1889-90	154	56	36.3

Percentage of graduates to matriculates for the past ten years, 37.5.

**Four years of study and three annual courses of lectures before graduation, will be required after the session of 1890-91.**

## MEDICAL COLLEGE OF KANSAS CITY.

Kansas City, Mo.

ORGANIZED in 1869. Three sessions were held.—Extinct in 1873.

## HOMEOPATHIC MEDICAL COLLEGE OF ST. LOUIS.

St. Louis, Mo.

ORGANIZED in 1873.—Extinct. Fraudulent.

## ST. LOUIS HAHNEMANN MEDICAL COLLEGE:

St. Louis, Mo.

ORGANIZED in 1873. Matriculates, 10; graduates, 4. Extinct in 1871.

## AMERICAN MEDICAL COLLEGE.

(Eclectic.)

ST. LOUIS, MO. E. YOUNKIN, M. D., Dean, 1015 Garrison avenue.

ORGANIZED in 1873. The first class graduated in 1874. Classes were graduated twice annually from that date up to 1883, but only one annual graduating session is now held.

The faculty consists of eleven professors, two lecturers and one demonstrator.

COURSE OF INSTRUCTION; The regular graduating session of 1890-91 commenced September 1, 1890, and will continue until June 4, 1891; any twenty weeks of said period are considered as attendance upon one full session. Clinics are given at hospital and college. Women admitted upon the same terms as men. A graded course of three years is provided.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, pharmacy, laryngology, ophthalmology, otology, diseases of children, clinical medicine, clinical surgery, diseases of the genito-urinary organs, toxicology, venereal diseases, and diseases of the skin and of the nervous system.

REQUIREMENTS: For admission—"Students who desire to enter this college must have at least a fair English education. Those who hold diplomas, or certificates of examination from good literary, scientific, or medical or pharmaceutical colleges or high schools, or first-grade teachers' certificates, will be accepted upon presenting their papers; lacking these, they will be required to pass the preliminary examination. This examination will be practical rather than technical, its object being to determine the candidates general knowledge and natural capacity, and whether his previous acquirements have been sufficient to enable him to pursue his study of medicine to advantage to himself and honor to the profession."

For graduation: 1) good moral character; 2) **four years's study**; 3) **three full courses of lectures**; 4) twenty-one years of age; 5) satisfactory final examination.

FEES: Tickets for the session of twenty weeks, including matriculation, \$75; demonstrator, \$3; for one college year of ten months, \$95; graduation, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	66	22	33.3
1881-82	118	40	33.9
1882-83	114	38	33.3
1883-84	65	15	23+
1884-85	24	14	58.3
1885-86	26	6	23+
1886-87	33	16	48.4
1887-88	44	13	29.5
1888-89	69	31	44.9
1889-90	63	25	39.6

Percentage of graduates to matriculates for past ten years, 35.3.

## ST. LOUIS ECLECTIC MEDICAL COLLEGE.

ST. LOUIS, MO.

ORGANIZED in 1874. Extinct in 1883. Closed by legal process. **Diplomas not recognized.**

## ST. JOSEPH HOSPITAL MEDICAL COLLEGE.

ST. JOSEPH, MO.

ORGANIZED in 1876. Five classes, containing forty-five students, were graduated. In 1882 this college was merged into the St. Joseph Medical College. See *Ensworth Medical College*.

## COLLEGE OF PHYSICIANS AND SURGEONS OF ST. JOSEPH.

ST. JOSEPH, MO.

ORGANIZED in 1876. Three classes, containing fifty students, were graduated. In 1882 this college was merged into the St. Joseph Medical College. See *Ensworth Medical College*.

## JOPLIN COLLEGE OF PHYSICIANS AND SURGEONS.

JOPLIN, Mo.

ORGANIZED in 1880. The first class was graduated in 1881. The school became extinct in 1884. **None of its diplomas recognized.**

## HERING MEDICAL COLLEGE.

(Homeopathic.)

St. Louis, Mo.

ORGANIZED in 1880. See *Homeopathic College of Missouri*.

## NORTHWESTERN MEDICAL COLLEGE, ST. JOSEPH, MO.

ST. JOSEPH, Mo. T. E. POTTER, M. D., Secretary, Sixth and Edmond streets.

ORGANIZED in 1880. The first class was graduated in 1881.

The faculty consists of eleven professors, one adjunct professor, one lecturer and two demonstrators.

**COURSE OF INSTRUCTION:** The regular graduating term began October 1, 1890, and continues twenty weeks. Preliminary course began September 10, 1890. Attendance on three courses of lectures is recommended, but not required.

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica and therapeutics, theory and practice of medicine, surgery, pathology, obstetrics and gynecology, hygiene, medical jurisprudence, diseases of children, ophthalmology, otology, diseases of the nervous system, clinical medicine, clinical surgery, diseases of the chest and dermatology.

**REQUIREMENTS:** For admission: "Proper evidence of a good common English education must be furnished by matriculants. This evidence must consist of diploma from high school, academy, literary college, or teacher's certificate from county or state superintendent of public schools. Lacking in some one of these evidences, a preliminary examination by the president of the faculty will be required."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) satisfactory examination.

**FEES:** Matriculation, \$5; each full course of lectures, \$45; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	40	23	57.5
1881-82	40	26	65
1882-83	51	18	58
1883-84	39	10	25.8
1884-85	28	14	50
1885-86	28	11	39.2
1886-87	31	13	41.9
1887-88	30	11	36.6
1888-89	43	15	34.8
1889-90	43	17	39.5

Percentage of graduates to matriculates for past ten years, 44.7.

**Three annual courses of lectures will be required after the session of 1890-91.**

## JOPLIN MEDICAL COLLEGE.

JOPLIN, Mo.

ORGANIZED in 1881.—Extinct in 1882.

**Diplomas not recognized.**

## AMERICAN ANTHROPOLOGICAL UNIVERSITY OF ST. LOUIS.

A diploma from this university was presented for record in Indiana in 1885. This is the first instance that has come to the knowledge of this BOARD of any of its diplomas being presented as a qualification to practice medicine in this country. Diplomas of this institution were sold in Scotland several years ago, and the attention of this BOARD was called to the same by Hon. John Eaton, then U. S. Commissioner of Education. Parties holding these diplomas were prosecuted for attempting to practice medicine in Germany in 1885. Recently it was found that more of them had been sold in the country, and the subject was a matter of correspondence between the German authorities and the State Department at Washington. This so-called institution never had a legitimate existence; only one of the original incorporators and officers is now living, and he has assured the Secretary that he never signed a diploma.

## UNIVERSITY MEDICAL COLLEGE OF KANSAS CITY.

(Formerly, University of Kansas City, Medical Department.)

KANSAS CITY, MO. LYMAN A. BERGER, A. M. M. D., Secretary, 1235 Grand avenue.

ORGANIZED in 1881. The first class was graduated in 1882.

The faculty consists of fourteen professors, one adjunct professor, two demonstrators and three lecturers.

**COURSE OF INSTRUCTION:** The tenth annual session commenced September 15, 1890, and continues twenty-six weeks. Instruction is given by lectures, clinics, practical courses in the dissecting room, laboratories, and by repeated examinations. A three years' graded course is recommended, and will soon be made obligatory.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, histology, medical jurisprudence, ophthalmology and otology, dermatology, nervous and mental diseases, orthopedic surgery, diseases of the throat and chest, diseases of children, pharmacy, genito-urinary diseases, clinical medicine, clinical surgery, microscopy, hygiene, physical diagnosis, railway surgery and bacteriology.

**REQUIREMENTS:** For admission—"Every applicant must be of good moral character, and possess the evidence of a good English education. He should also possess a sufficient knowledge of Latin to read and write current prescriptions. Every candidate for matriculation, unless a graduate of some college, high school or academy, or holding a certificate of some literary institution, will be examined to ascertain his fitness for entering upon and appreciating the study of medicine."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of lectures; 5) clinical instruction during one term; 6) dissection of each region of the body; 7) full and satisfactory examination in each branch; 8) punctual attendance on lectures and clinics.

**FEES:** Matriculation, \$5; lectures, \$50; demonstrator, \$10; practical chemistry (optional, chemicals at cost), \$10; bacteriology (optional), \$10; graduation, \$20.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	25	11	44
1882-83	28	8	38.6
1883-84	45	14	31.1
1884-85	35	16	45.7
1885-86	30	17	56.6
1886-87	24	6	25
1887-88	29	8	27.5
1888-89	42	15	35.7
1889-90	70	15	21.4

Percentage of graduates to matriculates for past nine years, 33.5.

**A three years' graded course of lectures, and four years of study will be obligatory after the session of 1890-91.**

## ENSWORTH MEDICAL COLLEGE.

ST. JOSEPH, MO. JACOB GEIGER, M. D., Secretary, 613 Francis street.

ORGANIZED in 1882, as the St. Joseph Medical College, by the union of the St. Joseph Hospital Medical College and the College of Physicians and Surgeons of St. Joseph. Re-organized in 1888 under above title. First class was graduated in 1885.

The faculty consists of twelve professors, one lecturer and two demonstrators.



**COURSE OF INSTRUCTION:** The fourteenth annual session began October 1, 1890, and will close the first week in March, 1891. Women admitted on the same terms as men.

Lectures embrace gynecology, obstetrics, surgery, diseases of children, principles and practice of medicine, materia medica and therapeutics, physiology, hygiene, chemistry, toxicology, anatomy, medical jurisprudence, ophthalmology and otology, pathology and microscopy, diseases of the nervous system, military and railroad surgery and dermatology.

**REQUIREMENTS:** For admission—1) good moral character; 2) a diploma of graduation from a good literary or scientific college or school or a first-grade teacher's certificate; 3) lacking this they must pass an examination in the branches of a common school education before a committee of the faculty.

For graduation: 1) twenty-one years of age and of good moral character; 2) have studied medicine for three years; 3) two full winter courses of lectures; 3) must have dissected each region of the body; 5) must have attended lectures regularly; 6) satisfactory examination in all branches.

**FEES:** Matriculation (paid but once), \$5; lectures, \$35; demonstrator and material, \$10; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1882-83	24	8	33.3
1883-84	35	6	17.1
1884-85	28	9	32.1
1885-86	26	11	42.3
1886-87	22	6	27.2
1887-88	31	10	32.2
1888-89	30	9	30.
1889-90	43	14	32.5

Percentage of graduates to matriculates for past eight years, 30.5.

**Four years of study and three regular graded courses of lectures will be required after the session of 1890-91.**

#### KANSAS CITY HOSPITAL COLLEGE OF MEDICINE.

KANSAS CITY, Mo.

ORGANIZED in 1882. The first class was graduated in 1883. Extinct in 1888.

#### WOMAN'S MEDICAL COLLEGE OF ST. LOUIS.

(Homeopathic.)

ST. LOUIS, Mo.

ORGANIZED in 1883. Extinct, 1884.

#### OCCIDENTAL COLLEGE OF PHYSICIANS AND SURGEONS.

JOPLIN, Mo.

INCORPORATED, 1886. Extinct, 1887.

#### BEAUMONT HOSPITAL MEDICAL COLLEGE.

ST. LOUIS, Mo. W. B. OUTTEN, M. D., Dean, 6th and Locust Streets.

ORGANIZED in 1886. The faculty consists of fourteen professors, five assistant professors and one demonstrator.

**COURSE OF INSTRUCTION:** The regular winter session commenced September 15, 1890, and will continue until March 28, 1891. Three courses of lectures recommended, and provision is made for the same, but not required at present. Special attention will be given to clinical and laboratory work.

Lectures embrace anatomy, physiology, chemistry, histology, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, mental and nervous diseases, ophthalmology, pathology, dermatology, otology, diseases of children, orthopedic surgery, diseases of the throat and chest and climatology, genito-urinary surgery, clinical medicine and clinical surgery, toxicology, demonstrations in surgery and electro-therapeutics.

**REQUIREMENTS:** For admission: Before matriculating every student must present evidence of a fair common school education.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) three years' study; 5) satisfactory examinations.

**FEES:** For first course students, in full, \$70; for second course students, in full, \$90.

No charges for matriculation, demonstrator's or hospital tickets. Diplomas gratis to those passing satisfactory examination.

**STUDENTS:** Number of matriculates and of graduates at each session reported and percentage of graduates to matriculates—

Session,	Matriculates.	Graduates.	Percent.
1886-87	51	18	35.3
1887-88	81	36	44.4
1888-89	63	22	34.9
1889-90	76	22	28.9

Percentage of graduates to matriculates for past four years, 36.1.

**After the session of 1890-91 attendance upon three annual courses of lectures and four years study will be required before graduation.**

#### KANSAS CITY HOMEOPATHIC MEDICAL COLLEGE.

KANSAS CITY, MO. PETER DIEDRICH, M. D., Dean., 518 Minnesota avenue.

ORGANIZED in 1888.

The faculty consists of eighteen professors and one demonstrator.

**COURSE OF INSTRUCTION:** The third annual session began September 16, 1890, and will continue six months. A three years' graded course is recommended, but not required. All first course students must enter upon the first year of the three years' graded course. Women admitted upon the same terms as men.

Lectures embrace anatomy, practical anatomy, physiology, chemistry and toxicology, pharmacy, diseases of children, materia medica and therapeutics, practice of medicine, pathology, ophthalmology, otology, physical diagnosis, surgery, obstetrics, gynecology, diseases of the nervous system, medical jurisprudence, hygiene, clinical medicine, histology, dermatology, microscopy, oral surgery and dentistry.

**REQUIREMENTS:** For admission: 1) good moral character; 2) diploma from some literary or scientific college, high school or academy, or a county or state teacher's certificate, or the certificate of the examining board of any accredited medical society; 4) lacking these, a satisfactory examination in elementary mathematics, history of United States, English composition, and elementary physics and natural philosophy.

For graduation: 1) twenty-one years of age; 2) good moral and professional standing; 3) three years' study of medicine; 4) two courses of practical anatomy; 5) **three courses of lectures;** 6) satisfactory examination.

**FEES:** Matriculation (once only) \$5; demonstrator, \$10; lectures, \$50; graduation, \$25; perpetual ticket, \$100.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1888-89	14	4	28.5
1889-90	17	6	35.2

Percentage of graduates to matriculates for past two years, 32.2

#### ST. LOUIS HYGIENIC COLLEGE OF PHYSICIANS AND SURGEONS.

ST. LOUIS, MO. SUSANNA W. DODDS, M. D., Dean, 2826 Washington avenue.

ORGANIZED in 1887.

The faculty consists of ten professors, two lecturers, and one demonstrator of anatomy.

**COURSE OF INSTRUCTION:** The fourth annual course began October 1, 1890, and will continue six months. **A graded course extending over a period of three years is required.** Women admitted upon same terms as men.

Lectures embrace, first year—*anatomy, physiology, chemistry, histology, toxicology, and the principles of hygieo-therapy, sanitation, dietetics, physical culture*; second year—*pathology, therapeutics, materia medica, diseases of the nervous system, surgery, morbid anatomy, obstetrics, diseases of women and children, rectal and renal diseases, sanitary engineering*; third year—*otology, ophthalmology, motorpathy, dermatology, medical jurisprudence, electro-therapeutics, dental science, microscopy and histology.*

**REQUIREMENTS:** For admission—1) good moral character; 2) satisfactory proof of a good English education; 3) or an examination by the faculty in ordinary English branches; certificate of graduation from a high school, academy or college, or teacher's certificate will exempt candidates from preliminary examination.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study of medicine; 4) **three courses of lectures**; 5) satisfactory examination.

**FEES:** Matriculation, \$5; fees for one course of lectures, \$60; practical anatomy, \$10; graduation fee, \$25; single tickets, \$10 each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1887-88	6	..	....
1888-89	18	..	....
1889-90	15	3	20

Percentage of graduates to matriculates for the past three years, 7.6.

## THE MARION-SIMS COLLEGE OF MEDICINE.

ST. LOUIS, MO. YOUNG H. BOND, M. D., Dean, Grand and Page avenue.

ORGANIZED in 1890. Special attention will be given to clinical and demonstrative teaching and practical work in the different laboratories will be insisted upon. A three-years' graded course is provided for. "The faculty recommends this course to all students and **contemplates its adoption for all its matriculates after 1892.**"

The faculty consists of twelve professors, six lecturers, one demonstrator and thirteen clinical assistants.

**COURSE OF INSTRUCTION:** The first session began October 1, 1890, and will close about the middle of March, 1891. A general spring course and practitioners' course begins in March and will end May 15, 1891, and will be mainly a clinical one.

Lectures embrace *anatomy, physiology, chemistry, materia medica, therapeutics, toxicology, practice of medicine, surgery, histology, pathology, obstetrics, gynecology, mental and nervous diseases, electro-therapy, ophthalmology, otology, laryngology, diseases of children, hygiene, diseases of the rectum, forensic medicine, dental and oral surgery.*

**REQUIREMENTS:** For admission—satisfactory evidence of a good English education by certificates of graduation from a literary or scientific college, academy or high school, or presentation of a teacher's certificate, or by examination before a committee of the faculty and must have a good moral character.

For graduation: 1) three-years' course of study; 2) two regular college courses; certificates of examination in other schools will not be accepted in lieu of final examination by the faculty of this college.

**FEE:** Matriculation, \$5; entire lecture fee, including matriculation, \$50; demonstrator, \$10; single ticket, \$10 each; final examination fee, \$25; sons and brothers of physicians and sons of the clergy, \$25; hospital ticket free; clinic tickets free.

## MONTANA.

**ACT TO REGULATE THE PRACTICE OF MEDICINE IN MONTANA.** Act approved Feb. 28, 1889. See this REPORT, 1889.

"The medical law in Montana is similar in most respects to the law of Illinois.

Under the law, as interpreted by the Hon. N. W. McConnell, ex-Chief Justice of Montana, the act creating the Board of Medical Examiners and regulating the practice of medicine in this state contemplates four classes of physicians and surgeons:

First. Those who are graduates in medicine and have diplomas, issued by a medical school, legally organized, and in good standing, whose teachers are graduates of a legally organized school.

"Second. Those who are not graduates, but who are now and were at the time this act came into operation, practicing medicine or surgery within this state, but who have not been continuously for ten years.

"Third. Those who have been continuously practicing medicine or surgery within this state for a period of not less than ten years at the time said act went into effect.

"Fourth. All persons hereafter commencing the practice of medicine or surgery within this state.

"As to the first class, no examination as to the attainments of the applicant in medical knowledge was required. All other classes and those acting subsequent to the passage of this act must submit to examination as prescribed in section Four of this act, to-wit: Upon the subjects of Anatomy, Physiology, Chemistry, Histology, Materia Medica, Therapeutics, Preventive Medicine, Practice of Medicine, Surgery, Obstetrics, Diseases of Women and Children, Diseases of the Nervous system, Diseases of the Eye and Ear, Medical Jurisprudence, and such other branches as the Board shall deem advisable.

"All persons coming into this state after the passage of this act, in addition to this examination must present evidence of having pursued at least three courses of lectures of four months each, before they shall be entitled to a certificate. The fee of such examination, or for verifying diplomas is invariably \$15, which is paid by applicant to the treasurer of this Board, and applied by said Board towards defraying the expenses thereof.

"Any person who may feel himself aggrieved at the action of the Board in denying him a certificate has a right to appeal to the District Court of the county where such applicant may have applied for certificate, or where his certificate may have been revoked, where he can have a trial by the court and determine the justice and legality of the Board's action in the premises."

#### BOARD OF MEDICAL EXAMINERS OF MONTANA.

GREAT FALLS, MONT. ERNEST CRUTCHER, M. D., Secretary.

The Board consists of seven members appointed by the Governor, for seven years each. It was organized April 2, 1889, since which time—to Nov. 29, 1890—there have been 238 applicants for certificates—practitioners and midwives. Certificates were issued to 180 practitioners and to 2 midwives, temporary certificates to 16 practitioners, and 6 to licentiates. In 30 cases certificates were refused, and 4 applications were withdrawn. The board has revoked 3 certificates.

**Section 4 of the Montana Medical Act, requiring not less than three courses of lectures of four months each, prevents the Board's issuing certificates on diplomas presented by persons that have taken but two courses of lectures.** By a recent resolution of the Board the Secretary was instructed to notify the medical colleges of this provision of the law.

"Montana," says the Secretary, "has been the paradise of quacks and charlatans, who have grown rich and powerful because of the large fees ordinarily prevailing in this state."

#### NEBRASKA.

##### OMAHA MEDICAL COLLEGE.

OMAHA, Neb. W. O. BRIDGES, M. D., Secretary.

ORGANIZED IN 1881. The outgrowth of a preparatory school, established in 1880 under the name of the Nebraska School of Medicine.

The faculty consists of seventeen professors, two lecturers and two demonstrators.

**COURSE OF INSTRUCTION:** The regular graduating session of 1890-91 began September 30, 1890, and will close March 25, 1891. The members of the faculty devote a portion of each day to examinations on the subjects of the previous lectures. Clinics are given at the college and in the hospital.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, histology, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology and otology, laryngology, toxicology, diseases of children, clinical medicine and clinical surgery, bacteriology and diseases of the mind.

**REQUIREMENTS:** For admission: "All candidates must present to the faculty satisfactory evidence of a good moral character, and must be at least eighteen years of age; and unless holding a certificate or diploma from some literary institution or a teacher's certificate, must pass an examination showing a fair English education."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) "such primary education as is clearly requisite for a proper standing with the public and the profession;" 4) three years' study; 5) two full courses of lectures; clinical instruction for two sessions; 7) practical anatomy two courses, and dissection of all regions of the body, chemistry, normal histology and pathological anatomy, one course; 8) full and satisfactory written and oral examination on each branch taught; 9) close attendance on all lectures.

**FEES:** Matriculation, \$5; demonstrator, \$5; lectures, 45; graduation, \$25; hospital, \$5; chemistry, histology and pathology, each, \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Sessions.	Matriculates.	Graduates.	Percent.
1881-82	33	8	23.
1882-83	30	9	30.
1883-84	20	4	20.
1884-85	21	8	38.
1885-86	28	5	17.8
1886-87	24	7	29.1
1887-88	24	10	41.6
1888-89	23	7	30.4
1889-90	26	4	15.3

Percentage of graduates to matriculates for past nine years, 27+.

**After the session of 1890-91, this school will require four years' study and three graded courses of lectures for graduation.**

#### UNIVERSITY OF NEBRASKA, COLLEGE OF MEDICINE.

LINCOLN, Neb.

ORGANIZED in 1870.—Extinct in 1887.

*(Homeopathic Department.)*

LINCOLN, Neb.

ORGANIZED in 1883.—Extinct in 1887.

*(Eclectic Department.)*

LINCOLN, Neb.

ORGANIZED in 1883.—Extinct in 1885.

#### MEDICAL DEPARTMENT COTNER UNIVERSITY.

LINCOLN, Nebraska. W. S. LATTI, M. D. Dean, Eleventh street, near O street.

ORGANIZED in 1890, as the Medical Department of the Nebraska Christian University, Bethany Heights, Lincoln.

The faculty consists of fourteen professors and one demonstrator.

**COURSE OF INSTRUCTION:** Covers a period of three years. The first annual course began September 15, 1890, and will continue six months. Women are admitted upon the same terms as men. Instruction is given by lectures, recitations, clinical teachings and practical work. Oral examinations will be held by the professors, and the student will be required to keep himself informed in regard to the subjects previously lectured upon by frequent reference to text-books.

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica therapeutics and dietetics, theory and practice of medicine, surgery, obstetrics, gynecology, hygiene, diseases of children, physical diagnosis, pathology, histology, microscopy, ophthalmology, otology, laryngology, electro-therapeutics, dermatology, venereal diseases, medical jurisprudence and diseases of the mind and nervous system.

**REQUIREMENTS:** For admission—"Each candidate for admission, must present a satisfactory certificate from a college or high school that he possesses sufficient general education to intelligently pursue the study of medicine; or in lieu of such proper testimony, must pass a satisfactory preliminary examination by the faculty on the subjects taught in our common school system."

For graduation: The candidate must be 1) twenty-one years of age; 2) of good moral character; 3) **must have attended three full courses of lectures of six months each;** 4) a satisfactory examination in every branch taught by the faculty in this department.

**FEES:** Tickets for one full course of lectures, \$50; matriculation fee (charged but once,) \$5; demonstrator's ticket and material, \$10; analytical chemistry and material, \$10; examination fee for graduation, \$25.

Scholarship entitling the purchaser to attend as many courses as he may desire may be had for \$100.

**NEW HAMPSHIRE.****DARTMOUTH MEDICAL COLLEGE.***(New Hampshire Medical Institute.)*

HANOVER, N. H. CARLTON P. FROST, M. D., Dean of the faculty.

ORGANIZED IN 1797. The first class was graduated in 1798. Classes have been graduated each subsequent year.

The faculty consists of thirteen professors and one lecturer.

**COURSE OF INSTRUCTION:** The collegiate year is divided into a lecture course and a recitation term. The regular lecture course for 1890 began July 16, and continued twenty weeks; the recitation term began January 2, 1891, and continues until June 20. "Clinical instruction will be given to as large an extent as circumstances will permit."

Lectures embrace anatomy, physiology, chemistry (lectures and laboratory work), materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, ophthalmology, laryngology, nervous and mental diseases.

**REQUIREMENTS:** For admission—"Applicants must be eighteen years of age, and, unless already matriculates of some regular medical college, or graduates of some reputable college, academy, or high school, will be examined as to their fitness for entering upon and appreciating the technical study of medicine."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three full courses of lectures**; 4) **four full years of study**; 5) dissected all parts of the cadaver; 6) shall pass satisfactory written examination on all branches taught in the school—anatomy physiology, chemistry, surgery, obstetrics, therapeutics, gynecology and practice. Two examinations annually.

**FEES:** Matriculation, \$5; lectures, \$77; graduation, \$25; chemicals, \$2; recitation term, \$40; chemistry, extra, \$15; anatomical material at cost.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	91	43	47.2
1882	76	28	36.8
1883	80	40	50.
1884	40	18	45.
1885	52	13	25.
1886	55	15	27.2
1887	56	19	33.9
1888	64	26	40.6
1889	67	20	29.8
1890	98	25	25.5

Percentage of graduates to matriculates for past ten years, 36.3.

**NEW ENGLAND UNIVERSITY OF THE ARTS AND SCIENCES.**

MANCHESTER, N. H.

**FRAUDULENT.**—Extinct. Incorporated 1876.—Act repealed 1877. Exposed by the ILLINOIS STATE BOARD OF HEALTH.

**UNIVERSITY OF NEW HAMPSHIRE, DEPARTMENT OF MEDICINE.**

NASHUA, N. H. HENRY FREELAND BRADBURY, M. D., Secretary, 30 Pearl street.

INCORPORATED October, 1888.

**FRAUDULENT.** An investigation of this institution was made by Dr. D. S. Adams, of Manchester, President of the New Hampshire State Board of Censors, and by the Boston *Herald*, which led to the exposure of its true character. Dr. Bradbury, the secretary, was indicted by the U. S. Grand Jury, at Concord, and on October 9th, was convicted of using the mail for fraudulent purposes. He was sentenced to pay a fine of \$250, and not having any money was sent to jail. He was also interested in the Trinity University, of Bennington, Vermont, and seems to have been the agent for the sale of diplomas of fraudulent colleges located in other states. Prices of diplomas varied from \$60 to \$300, and were sent by express after nominal compliance with rules for graduation. In New Hampshire and Vermont, and until very recently in Massachusetts, the existence of this kind of a school was made possible owing to the laxity of the laws in regard to incorporating for general purposes or for purposes of the dissemination of knowledge.

## NEW JERSEY.

## AN ACT TO REGULATE THE PRACTICE OF MEDICINE AND SURGERY, TO LICENSE PHYSICIANS AND SURGEONS AND TO PUNISH PERSONS VIOLATING THE PROVISIONS THEREOF.

1. *Be it enacted by the Senate and General Assembly of the State of New Jersey,* That the Governor shall appoint a Board of Examiners, to be known as the State Board of Medical Examiners; said board shall consist of nine members; the appointees shall be persons of recognized professional ability and honor; the terms of office of said board shall be three years, or until their successors are appointed; provided, however, that the members of the Board first appointed shall be divided into three classes each class to consist of three persons: the first class shall hold office under said appointment for one year, the second for two years and the third for three years from the date of their appointment, and thereafter each member of said board shall be appointed for a term of three years; and provided further, that said board shall consist of five old school, three homeopaths and one eclectic; it is further provided, that no member of said board shall serve more than two terms in succession; no member of any college or university having a medical department shall be appointed to serve as a member of said board.

2. *And be it enacted,* That said Board of Medical Examiners shall elect a president a secretary and a treasurer; it shall have a common seal, and the president shall be empowered to administer oaths in taking testimony upon any matter pertaining to the duties of said board; said board shall hold meetings for examinations at the capitol building of this State, the second Thursday of January, April, July and October of each year, and at such other times and places as the board shall deem expedient, said board shall keep an official record of all its meetings, also an official register of all applicants for examination for a license to practice medicine and surgery in this State; said register for license shall show the name, age and last place of residence of each candidate, the time he or she has spent in medical study, in or out of medical school, and the names and locations of all medical schools which have granted said applicant any degree or certificate of attendance upon lectures in medicine; said register shall also show whether such applicant was rejected or licensed under this act; said register shall be *prima facie* evidence of all matters therein contained.

3. *And be it enacted,* That all persons hereafter commencing the practice of medicine or surgery, in any of its branches in this State, shall apply to said Board of Medical Examiners for a license so to do; applicants for examination shall be divided into three classes, to-wit: first, persons graduated from a legally chartered medical school not less than five years before the date of application for a license; second, all other persons graduated from a legally chartered medical school; and third, medical students taking a regular course of medical instruction; applicants of the first class shall submit to examination upon the following named branches, to-wit: materia medica and therapeutics, obstetrics and gynecology, practice of medicine, surgery and surgical anatomy; those of the second and third classes shall submit to examination upon anatomy, physiology, chemistry, pathology, materia medica and therapeutics, histology, hygiene, practice of medicine, surgery, obstetrics and gynecology, diseases of the eye and ear, medical jurisprudence and such other branches as the board may deem advisable; the questions for examination of applicants of the first and second classes shall be the same in branches common to both; said board shall not license applicants of the second and third classes after January first, one thousand eight hundred and ninety-two, until satisfactory proof is furnished that the applicant has studied medicine and surgery three years, is of good moral character and over twenty-one years of age; applicants of the third class, after they shall have studied medicine and surgery at least two years, can be examined upon the following named branches, to-wit: anatomy, physiology, chemistry, histology and pathology, materia medica and therapeutics; if said examination is satisfactory to all the members of said board, it may issue a certificate that the applicant has passed a final examination in these branches, and such certificate, if presented by the applicant when he or she shall make the application for license to practice, shall be accepted by said board in lieu of an examination in those branches; all examinations shall be both scientific and practical, but of sufficient severity to test the candidates' fitness to practice medicine and surgery.

4. *And be it enacted,* That all examinations shall be in writing; in all examinations the questions and answers must be, except in materia medica and therapeutics such as can be answered in common by all schools of practice; and if the applicant intends to practice homoeopathy or eclecticism the member or members of said board of those schools shall examine said applicant in materia medica and therapeutics; if said examination is satisfactory, the board shall issue a license entitling the applicant to practice medicine in this State; the votes of all examiners shall be by yes or no and written, with their signatures, upon the backs of the examination papers of each candidate for the respective branches; a license shall not issue in any case unless the applicant passes an examination satisfactory to all the members of said board; said examination papers shall be kept on file by the secretary of said board, and shall be *prima facie* evidence of all matters therein contained; any applicant refused a license by said board for failure on examination may appeal from the decision of said board to the appointing power thereof, who may thereupon appoint a medical committee of review consisting of three members, one from each school of medicine, who shall examine the examination papers of the said applicant, and from them determine whether a license should issue, and their decision shall be final; if said commission by an unanimous vote reverse the determination of the board the board shall thereupon issue a license to the applicant, the expense of said appeal shall be borne by the applicant; all licenses shall be signed by the president and secretary of said board, and shall be attested by the seal thereof; the fee for examination shall be fifteen dollars for each applicant of the first and second classes, and twenty dollars for each applicant of the third class; it shall be paid to the treasurer of the board and applied towards defraying the expenses thereof.

5. *And be it enacted,* That the board may by a unanimous vote, refuse to grant, or may revoke a license for the following causes, to-wit: chronic and persistent inebriety, the practice of criminal abortion, conviction of crime involving moral turpitude or for publicly

advertising special ability to treat or cure diseases which, in the opinion of said board, it is impossible to cure; in complaints for violating the provisions of this section, the accused person shall be furnished with a copy of the complaint, and given a hearing before said board in person or by attorney.

6. *And be it enacted*, That the person so receiving said license shall file the same or a certified copy thereof, with the clerk of the county in which he or she resides, and said clerk shall file said certificate or copy thereof, and enter a memorandum thereof, giving the date of said license and the name of the person to whom the same is issued, and the date of said filing, in a book to be provided and kept for that purpose; and for which registry the said county clerk shall be entitled to demand and receive from each person registering the sum of fifty cents; in case a person so licensed shall so move into another county of this State he or she shall procure from the said clerk a certified copy of said license and then file the same with the clerk in the county to which he or she shall remove, said clerk shall file and enter the same with like effect as if the same was the original license, and for which registry the said county clerk shall be entitled to demand and receive the sum of fifty cents.

7. *And be it enacted*, That this act shall not apply to the commissioned surgeons of the United States Army, Navy or Marine Hospital Service or to regularly licensed physicians or surgeons in actual consultation from other states or territories, or to regularly licensed physicians or surgeons actually called from other states or territories to attend cases in this State, or to any person now entitled to practice medicine in this State.

8. *And be it enacted*, That any person shall be regarded as practicing medicine or surgery, within the meaning of this act, who shall append the letters M. D. or M. B. to his or her name, or prescribe, for the use of any person or persons, any drug or medicine or other agency for the treatment, cure or relief of any bodily injury, infirmity or disease; this act shall not apply to dentists in the legitimate practice of their profession.

9. *And be it enacted*. That any person hereafter commencing the practice of medicine or surgery in this State without first having obtained the license herein provided for, or contrary to the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than fifty dollars or more than one hundred dollars, or by imprisonment in the county jail for a period of not less than ten or more than ninety days, or both fine and imprisonment; it shall be the duty of the respective county attorneys to prosecute violations of the provisions of this act.

10. *And be it enacted*, That the expenses of said board and of the examinations shall be paid from the license fees above provided for, and if any surplus remain, the same may be distributed among the members of said board as a compensation for their services as members, who otherwise shall receive no compensation whatever.

11. *And be it enacted*, That all acts or parts of acts, general or special, now existing, not in accordance with the provisions of this act, or inconsistent therewith, are hereby repealed.

Approved May 12, 1890.

## STATE BOARD OF MEDICAL EXAMINERS OF NEW JERSEY.

JERSEY CITY, N. J. WM. PERRY WATSON, M. D., Secretary.

The Board was organized September 2, 1890, in accordance with the Medical Practice Act. At the first examination there were 11 candidates for license to practice; of these 10 were granted licenses.

At the meeting of the Board on September 18, 1890, the following were adopted:

### REGULATIONS FOR CONDUCTING EXAMINATIONS.

1. Each candidate shall present certificates of age, moral character, preliminary education, and time and place of medical studies. Each of these certificates shall be accompanied by an affidavit if the Board so directs.

2. All examinations shall be in writing (with ink) upon paper furnished by the Secretary.

As many candidates may be examined at each session as circumstances will permit, making each section as large as convenient.

3. The examinations shall continue two days; the sessions of the first day being from 9-11, 11-1, 2-4, 4-6 and 8-10 respectively; the sessions of the second day being from 9-11, 11-1, 2-4 and 4-6 respectively. The final meeting for the adjudication of the results of the examinations shall be held at 8 o'clock in the evening of the second day.

4. The Examiner in each branch shall not be engaged in any other business except supervising the examination while it is going on, and there shall be one or more associate examiners present with him during the entire session.

5. A total average of 75 per cent. shall be necessary to license a candidate, providing that in no one branch shall the average percentage be less than 33½ per cent., in which case, however, should the total average percentage in all the other branches be above 75 per cent., the candidate may be granted a second examination immediately upon that branch.



6. Each candidate shall sign a pledge that he has neither given nor received any information concerning the examination or used in any way unfair means during the same.

This pledge with the real name and number in a sealed envelope with the number upon it, together with the examination paper, which shall be signed only with the number, shall be given to the Secretary immediately after the conclusion of the examination.

The same number shall be used by a candidate during the whole series of his examinations.

7. Any candidate found guilty of violating his pledge, in giving or receiving information, shall be adjudged guilty of grossly immoral conduct, and shall be rejected.

8. No fee will be returned to a candidate after he has commenced his examination. A rejected candidate can be re-examined within one year without an additional fee.

9. These regulations may be amended by a two-thirds vote of the Board; said amendment having been read at a previous meeting and being spread in full upon the call for the meeting at which action thereon is to be taken.

The following table shows the number examined, licensed and refused, and the colleges represented:

INSTITUTIONS REPRESENTED BY THE APPLICANTS BEFORE THE STATE BOARD OF MEDICAL EXAMINERS OF NEW JERSEY, September 2, 1890.	No. Examined.	Licensed .....	Rejected.....
University of Padua, Italy.....	1	1	.....
Hahnemann Medical College, Philadelphia, Pa.....	1	1	.....
University of the City of New York, New York City.....	2	2	.....
Medical Department University of Pennsylvania, Philadelphia, Pa.....	3	3	.....
College of Physicians and Surgeons, Baltimore, Md.....	1	1	.....
New York Medical College and Hospital for Women, New York City.....	1	1	.....
Jefferson Medical College, Philadelphia, Pa.....	2	1	1
Total.....	11	10	1

#### LIVINGSTON UNIVERSITY.

HADDONFIELD, N. J.

A BUCHANAN institution; fraudulent and extinct.

#### HYGIEIO-THERAPEUTIC COLLEGE.

BERGEN HEIGHTS, N. J.

EXTINCT.

#### MEDICAL AND SURGICAL COLLEGE OF THE STATE OF NEW JERSEY?

JERSEY CITY, N. J. 47 Montgomery street.

L. D. BROUGHTON, M. D., President, New York City.

CHARTERED March 7, 1870, by special Act of the Legislature. Nothing was heard of this school until 1888.

The institution was temporarily closed by injunction of the Hudson County Medical Society. The State Board of Medical Examiners on November 11, 1890, took action toward securing the repeal of its charter at the coming session of the State Legislature.

#### Diplomas not recognized.

The following was adopted by the District Medical Society for the County of Hudson, N. J., on December 16, 1890:

WHEREAS: A certain medical institute, called the "Medical and Surgical College of the State of New Jersey," chartered by special Act of this State, approved March 17, 1870, was organized during the year 1888, and opened in three small rooms on the top floor of the general office building, No. 47 Montgomery street, Jersey City, and

WHEREAS: Said alleged college has graduated several students whose diplomas have been presented to the Hudson County Board of Health, and who have been refused registration, and

WHEREAS: It has appeared to this Society, by good and sufficient evidence, that several members of the faculty, nearly all of whom are non-residents of this State, are either incompetent to deliver lectures on the topics assigned them, or are graduates or disreputable or fraudulent medical colleges; that the facilities for instruction in said alleged college are totally inadequate, and that no clinics, dissections or hospital practice have been or can be given; that the provisions of the charter of said college have not been observed by the authorities thereof; that the requirements of said charter, even if the same were strictly followed, are far below the standard of minimum requirements of medical colleges adopted and demanded by all medical authorities at the present time, and that, therefore, the possession of a diploma from said alleged college is no proof whatever that the holder thereof has received a good and sufficient medical education, and

WHEREAS: The State Board of Medical Examiners of this State will introduce a bill at the next meeting of the legislature for the purpose of repealing said charter: Be it

*Resolved*, That the District Medical Society for the County of Hudson does hereby earnestly protest against the existence of said alleged college as an unnecessary, inadequate and disreputable institution, tending to degrade and lower the standard of the medical profession; that the influence of this Society and of the individual members thereof be given to the support and passage of the bill to repeal said charter, and that a copy of this resolution be forwarded to the several medical societies of this State, with requests for their support and influence for the passage of said bill.

[ATTEST:]

HENRY B. RUE, M. D., Secretary.

## New York.

### LICENSE TO PRACTICE MEDICINE.

Laws of 1887, ch. 647; § 2 as amended by laws of 1890, ch. 500.

#### TO REGULATE THE LICENSING AND REGISTRATION OF PHYSICIANS AND SURGEONS, AND TO CODIFY THE MEDICAL LAWS OF THE STATE OF NEW YORK.

SECTION 1. No person shall practice physic or surgery in this State who shall not have attained the age of twenty-one years; and no person shall practice as aforesaid unless he or she shall be, at the time this act shall take effect, a person lawfully engaged in such practice in this State under license or authority conferred by its laws then in force, and lawfully registered pursuant to chapter five hundred and thirteen of the laws of eighteen hundred and eighty, and the acts amendatory thereof, or unless he or she shall be licensed or authorized so to practice by the provisions of this act, and registered as herein prescribed.

§ 2. From and after the date of the taking effect of this act, no person not theretofore licensed or authorized to practice physic or surgery in this State shall be deemed so licensed or authorized except one of the three following classes:

*First.* All who shall have been graduated from an incorporated medical school or college in this State with the degree of doctor of medicine, after substantial compliance with all the requirements of the general laws and of the charter of said corporation regulating the term and amount of study, attendance and attainment requisite to obtain said degree; provided that no person shall receive the degree of doctor of medicine, or be licensed to practice physic or surgery in this State, unless, after the age of 18, he shall have pursued the study of medical science for at least three years in a chartered medical school, or with some physician and surgeon duly authorized by law to practice physic or surgery, and shall have attended two complete courses of lectures in some legally incorporated medical school or college in good standing at the time of such attendance, prior to the granting to him or her a diploma or license. Provided, further, that two courses of lectures, both of which shall be either begun or completed within the same calendar year, shall not satisfy the above requirement.

*Second.* All who have received said degree from the regents of the University of the State of New York after substantial compliance with the legal requisites preliminary to its attainment, and after examination by a legally constituted board of medical examiners of this State.

*Third.* All who, having been graduated from incorporated medical schools or colleges without the State as doctors of medicine, or licensed to practice physic or surgery under the laws of those European countries in which said degree does not confer the right so to practice, shall procure their diplomas from said corporations, or their licenses from such countries, to be endorsed by the regents of the University on the recommendation of a legally constituted board of medical examiners of this State. Every such indorsement shall be in the form of schedule A or of schedule B, provided by the tenth section of this act. The regents shall keep a record of such indorsements, and may require applicants to verify their statements under oath; any indorsement made with fraudulent intent, or gross carelessness or ignorance, shall be deemed a misdemeanor, and shall subject the indorser or indorsers, upon conviction thereof, to a fine of \$250; provided, however, that no such indorsement as is above specified shall be made until the applicant thereof shall file with the person, officer or body above named as authorized to make such indorsement, a certificate, signed by the secretary of the University of the State of New York, showing that such applicant has received the degree of bachelor or master of arts, of bachelor or master of science, or of bachelor or doctor of philosophy, from a college or university duly authorized to confer the same; or that he has passed an examination conducted under the authority and in accordance with the rules of the regents of the University of the State of New York, in arithmetic, grammar, geography, spelling, American

history, English composition and elementary physics; or that he possesses qualifications which the regents have considered and accepted as fully equivalent to the above named qualifications; as such degrees and certificate are more particularly defined in an act of the legislature of the State of New York, by chapter 468 of the laws of 1889, entitled "An act to provide for the preliminary education of medical students," and as the same may be hereafter amended.

§ 3. Every person who, at the time this act shall take effect, shall be practicing lawfully physic or surgery in this State, under the authority and license conferred by the laws then in force, but who shall not be then duly registered in the county where he or she practices; and every person who shall thereafter become lawfully authorized or licensed to practice physic or surgery in this State, shall register in a book to be kept in the clerk's office of the county in which such practice is carried on, his or her name, residence, place and date of birth, and authority for practicing as aforesaid. Every person who shall apply to register as a physician or surgeon shall be required, before registration, to subscribe and verify by oath or affirmation, before a person qualified to administer oaths in this State, an affidavit which shall be filed and preserved in a bound volume. Every person registering as aforesaid shall exhibit to the county clerk his or her diploma or license, or in case of loss, a copy of either, legally certified as are copies of documents admitted in evidence, or a duly attested transcript of the record of its conferment from the body conferring it, upon which the said clerk shall indorse, or stamp his name, and the words, "Presented and registered as authority to practice physic and surgery by \_\_\_\_\_ on the \_\_\_\_\_ day of \_\_\_\_\_ in the clerk's office of \_\_\_\_\_ county." The said clerk shall also give to every registered physician or surgeon a certificate in the form of schedule D, provided by the tenth section of this act. For all of his said services the county clerk shall receive as a total fee for registration, affidavit and certificate the sum of one dollar. It is provided, however, that nothing in this act shall require any physician or surgeon who shall have duly registered lawful authority to practice as such, conformably to the provisions of chapter five hundred and thirteen of the laws of eighteen hundred and eighty, and the acts amendatory thereof, to register again under the provisions of this act, in any county where he or she shall have registered already.

§ 4. A practicing physician or surgeon having registered lawful authority to practice physic or surgery in one county, who shall remove his practice or part thereof to or regularly engage in practice or open an office in another county, shall exhibit in person to the clerk of such other county, or shall send to him through the mail by registered letter, his certificate of registration, and if such certificate shows lawful authority to have been registered said clerk thereupon shall register said applicant in said latter county, on a receipt of a fee of twenty-five cents. The clerk shall stamp or indorse upon such certificate the words "Registered also in \_\_\_\_\_ county," and return the same and every certificate and indorsement made pursuant to the provisions of this act shall be *prima facie* evidence in any legal proceeding that the person named has registered in the office issuing the same, the authority stated in the transcript.

§ 5. Every person now licensed to practice physic or surgery in this state under the laws thereof in force at the time of the conferment of such license, unless he or she already shall have registered his or her name, residence, place of birth and authority so to practice pursuant to the provisions of section two of chapter five hundred and thirteen of the laws of eighteen hundred and eighty, and the acts amendatory thereof, shall comply with the requirements of said chapter on or before the first day of October, eighteen hundred and eighty-seven; and thereafter no person shall be entitled to register any authority to practice physic or surgery, except the license conferred under this act, and the laws enacted hereafter, and no registration shall be considered valid as such unless the authority registered constituted at the time of registration a license under the laws of this state then in force; provided that nothing in this section shall be construed to prohibit or suspend any prosecution for non-registration under said section instituted prior to said first day of October, eighteen hundred and eighty-seven, and further provided, that no diploma or license conferred upon a person not actually in attendance at the lectures, instruction and examination of the corporation conferring the same, or not possessed at the time of its conferment of the requirements then demanded of medical students in this state as a condition of their becoming licensed so to practice, shall be deemed lawful authority to practice physic and surgery in this state.

§ 6. No person shall be licensed or permitted to practice physic or surgery in this state who has been convicted of a felony by any court of competent jurisdiction; and if any person who is or hereafter shall be duly licensed to practice physic or surgery in this state, shall be convicted of a felony, as aforesaid, his or her license to so practice, if any, shall be revoked by the fact of such conviction having been had. Any person who shall wilfully swear falsely to any statement contained in any affidavit made pursuant to the provisions of this act shall be deemed guilty of a felony, and subject to conviction and punishment for perjury; any person who falsely and without authority shall counterfeit, make or alter any diploma, certificate or instrument constituting a license to practice physic or surgery within this state, or any certificate or indorsement given in pursuance of this act shall be deemed guilty of a felony, and be subject to conviction and punishment for forgery in the second degree; any person who shall practice physic or surgery under a false or assumed name, or who shall falsely personate another practitioner of a like or different name, shall be deemed guilty of a felony, and shall be subject to conviction and punishment for false personation; and any person guilty of violating any of the other provisions of this act, not otherwise specifically punished herein, or who shall buy, sell or fraudulently obtain any medical diploma, license, record or registration, or who shall aid or abet such buying, selling or fraudulently obtaining thereof, or who shall practice physic or surgery in this state under cover of a diploma or license that shall have been illegally obtained, or that shall have been signed or issued unlawfully or under fraudulent representations, or mistake of fact in material regard, or who, after conviction of a felony, as aforesaid, shall attempt to practice physic or surgery in this state, and any person who shall assume the title of doctor of medicine, or append the letters "M. D." to his or her name, without having received the degree of doctor of medicine from some school, college or board empowered by law to

confer said degree or title, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than two hundred and fifty dollars, or imprisonment for six months for the first offense, and upon conviction of a subsequent offense, by a fine of not less than five hundred dollars, or imprisonment for not less than one year, or by both fine and imprisonment. Any person who, not being then lawfully authorized to practice physic or surgery in this state and so registered according to law, shall practice on or after the first day of October, eighteen hundred and eighty-seven, physic or surgery within this state without the license and registration provided for in this act, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than fifty dollars for the first offense, and for each subsequent offense by a fine of not less than one hundred dollars, or by imprisonment for not less than one hundred days, or by both fine and imprisonment. When any prosecution under this act is made on the complaint of a lawfully incorporated medical society of this state, or a county society entitled to representation in a state society or association, the fines when collected shall be paid to the society making the complaint, and any excess of the amount of fines so paid over the expense incurred by the said society in enforcing the medical law of this state, shall be paid at the end of the year to the county treasurer, for the use of the poor of said county.

§ 7. The duly incorporated medical societies of any county in which any person shall practice physic or surgery without lawful authority or registration may, upon proof of such practice, recover from such practitioner, in an action before any justice of the peace, a penalty of twenty-five dollars and the cost of the action for the first judgment, and upon every subsequent judgment for the same offense a penalty of fifty dollars and the cost of the action; provided that said societies shall pay to the county treasurer for the use of the poor of said county any surplus that may accrue in their hands from the excess of fines and penalties collected over the disbursements of said society for counsel fees and the expenses incident to the enforcement of this act by them.

§ 8. Nothing in this act shall be construed to punish commissioned medical officers serving in the army or navy of the United States, or in the United States marine hospital service, while so commissioned, or any one while actually serving as a member of the resident medical staff of any legally incorporated hospital, or any legally qualified and registered dentist exclusively engaged in practicing the art of dentistry, or interfere with manufacturers of artificial eyes, limbs, or orthopedical instruments or trusses of any kind from fitting such instruments on persons in need thereof; or any lawfully qualified physicians and surgeons residing in other states or countries meeting registered physicians and surgeons of this state in consultation, or any physician or surgeon residing on the border of a neighboring state, and duly authorized under the laws thereof to practice physic or surgery therein, whose practice extends into the limits of this state; providing that such practitioner shall not open an office or appoint a place to meet patients or receive calls within the limits of the state of New York; or physicians duly registered in one county of this state, called to attend isolated cases in another county, but not residing or habitually practicing therein.

§ 9 is a summary of acts repealed.

§ 10 prescribes the forms of affidavits.

## BOARDS OF MEDICAL EXAMINERS OF THE STATE OF NEW YORK.

TO ESTABLISH BOARDS OF MEDICAL EXAMINERS OF THE STATE OF NEW YORK FOR THE EXAMINATION AND LICENSING OF PRACTITIONERS OF MEDICINE AND SURGERY; TO FURTHER REGULATE THE PRACTICE OF MEDICINE AND SURGERY.

Laws of 1890, ch. 507.

§ 1. From and after the first day of September, 1891, there shall be and continue to be three separate boards of medical examiners for the state of New York, one representing the Medical Society of the State of New York, one representing the Homeopathic Medical Society of the State of New York, and one representing the Eclectic Medical Society of the State of New York. Each board shall consist of seven members, and each of said members shall serve for a term of three years, from the first day of September next after his appointment, with the exception of those first appointed, who shall serve as follows: Two of each board for one year, two of each board for two years, and three of each board for three years, from the first day of September, 1891. The power of appointment shall vest in the Board of Regents of the University of the State of New York, which shall appoint the members of said boards of examiners respectively, from lists of nominees to be submitted by each of the said three medical societies, the number of nominees by each of said societies to equal or exceed twice the number of appointments so to be made from each of said societies. Each of said nominees shall be nominated by a majority vote at the annual meetings of the society with which said nominee may be in affiliation, and the names of persons so nominated shall be transmitted before the first day of July, 1891, to the said Board of Regents, under the seal of and signed by the president and secretary of the society so nominating. From these lists of nominees respectively, said Board of Regents, shall prior to or during the month of July, 1891, appoint three separate boards of examiners, each board to be composed exclusively of members of the same medical society. In case of failure of any or all of said medical societies to submit nominees as aforesaid, said Board of Regents shall prior to or during the month of July, 1891, appoint members in good standing of the corresponding society or societies entitled to nominate, without other restriction. Each one of said appointees, prior to appointment, shall furnish evidence of having received the degree of doctor of medicine in course from some legally incorporated medical college authorized to confer the same, and shall certify to said Board of Regents to having practiced medicine or surgery under the laws of this state for a period of not less than five years immediately prior to such appointment. The said Board of Regents shall fill vacan-

cies caused by death or otherwise, for unexpired terms of said examiners from the respective lists of nominees submitted by the said medical societies; and may remove any member of either of said boards for continued neglect of the duties required by this act, or on recommendation of the medical society of which said members may be in affiliation, for unprofessional or dishonorable conduct. The Board of Regents shall, in their first appointments designate the number of years for which each appointee shall serve. The appointments of successors to those members whose terms of office will expire on the first day of September of each year, shall be made to the regents during or before the month of July of such year, upon the same conditions and requirements as hereinbefore specified with reference to the appointment of three separate examining boards, each to be composed exclusively of members of the same medical school and society, as are hereinbefore provided.

§ 2. Said boards shall be known by the name and style of Boards of Medical Examiners of the State of New York. Every person who shall be appointed to serve on either of said boards shall receive a certificate of appointment from the Regents of the University, and within 30 days after receiving such certificate shall take, subscribe and file in the office of the Secretary of State the oath prescribed by the twelfth article of the constitution of this state. Each of said boards shall be authorized to take testimony concerning all matters within its jurisdiction, and the presiding officer, for the time being of either of said boards, or of any of the committees thereof, may issue subpoenas and administer oaths to witnesses. Each of said boards of examiners shall make and adopt all necessary rules, regulations and by-laws not inconsistent with the constitution and laws of this state or of the United States, whereby to perform the duties and transact the business required under the provisions of this act, said rules, regulations and by-laws to be subject to the approval of said regents.

§ 3. From the income provided by this act the regents may pay, not to exceed, said income, all proper expenses incurred by its provisions; and if any surplus above said expenses shall remain at the end of any year, it shall be apportioned by said regents among said examiners pro rata, according to the number of candidates examined by each.

§ 4. The first meeting of each of the examining boards respectively shall be held pursuant to a call issued by the secretary of the Board of Regents, within two months from the first day of September, 1891, suitable notice in the usual form being given to each of the members thereof, specifying the time and place of meeting. At the first meeting of each of the boards respectively, an organization shall be effected by the election, from their own membership, of a president and secretary. For the purpose of examining applicants for license, each of said boards of medical examiners shall hold one or more stated or special meetings in each year pursuant to a call of the Board of Regents, due notice of which shall be made public, at such times and places as may be determined by the Board of Regents; but each examination shall be under the supervision of an examiner appointed by the Board of Regents, and who shall not be a member of any board of medical examiners. At said stated or special meetings a majority of the members of a board shall constitute a quorum thereof, but the examination may be conducted by a committee of one or more members of the board of examiners, duly authorized by such board.

§ 5. The several boards of medical examiners shall submit to the Board of Regents lists of examination questions for thorough examinations in anatomy, physiology and hygiene, chemistry, surgery, obstetrics, pathology and diagnosis, and therapeutics, including practice and materia medica; from the lists of questions so submitted the Board of Regents shall select the questions for each examination, and present the same to the candidates at each examination by an examiner appointed therefor by the Board of Regents, and such questions for each examination shall be so selected as to require the same standard of excellence, from all candidates except that in the department of therapeutics, practice and materia medica the questions shall be in harmony with the tenets of the school selected by the candidate.

§ 6. Said examinations shall be conducted in writing, in accordance with the rules and regulations prescribed by the Board of Regents, and shall embrace the subjects named in section five of this act. At the close of said examination the examiner appointed by the Board of Regents having supervision thereof, shall forthwith deliver to the board of medical examiners having charge of such examination, or to their duly authorized committee, the questions submitted to and the answers of each applicant, and such board of medical examiners, without unnecessary delay, shall transmit to the Regents of the University an official report, signed by the president, secretary and each acting member of said board of examiners, stating the examination average of each candidate in each branch, the general average, and the result of the examination, whether successful or unsuccessful. Said report shall embrace all the examination papers, questions and answers thereto. All the examination papers so returned shall be kept for reference and inspection among the public records of the University.

§ 7. On receiving from either of said boards of medical examiners such official report of the examination of any applicant for license, the said regents shall issue to every applicant who shall have been returned as having successfully passed said examination, and who shall in their judgment be duly qualified therefor, a license to practice medicine and surgery in the state of New York. The board of regents shall require the same standard of qualifications from all candidates, except in the department of therapeutics, practice and materia medica, in which the standard shall be determined by each of the boards of medical examiners respectively. Every license to practice medicine or surgery, issued pursuant to the provisions of this act, shall be subscribed by the Chancellor and Secretary of the University of the State of New York, by each medical examiner who reported the licensee as having successfully passed said examinations, and also by those of the regents who examined and approved the credentials of said licensee upon the application for examination. It shall also have affixed to it, by the person authorized to affix the same, the seal of said University. Every such license shall be substantially in the following form:

"The Regents of the University of the State of New York. To all whom it may concern, greeting:

Be it known that A B, on the..... day of..... A. D..... having offered to us satisfactory proof that..... was more than 21 years of age, and had received a proper preliminary education; that..... had attended three full courses of medical instruction, the last course at..... in..... in the year of..... and had received from the..... of..... the degree of doctor of medicine; we thereupon gave a written order for the examination of said A B, before one of the boards of medical examiners of the state of New York; that the said A B, was fully examined before said board and found proficient and qualified to practice medicine and surgery by the examiners whose signatures are hereto attached. We, therefore, have granted to said A B, this our license to practice medicine and surgery in the state of New York as a physician and surgeon, and have caused the names of the Chancellor and Secretary of our Board of Regents and said examiners to be subscribed, and the seal of the University to be affixed hereto, and have also caused this license to be recorded in book..... of medical license, on page..... Before said license shall be issued, it shall be recorded in a book to be kept in the office of said regents, and the number of the book and the page therein containing said recorded copy shall be noted in the body of the license. Said records shall be open to public inspection, under proper restrictions as to their safe-keeping, and in all legal proceedings shall have the same weight as evidence that is given to the record of the conveyances of land.

§ 8. From and after the first day of September, 1891, any person not theretofore lawfully authorized to practice medicine and surgery in this state, and desiring to enter upon such practice, may deliver to the Regents of the University, upon the payment of \$25 into the treasury of the University of the State of New York, a written application for license, together with satisfactory proof that the applicant is more than twenty-one years of age, is of good moral character, has obtained a competent common school education, and has either received a diploma conferring the degree of doctor of medicine from some legally incorporated medical college in the United States, or a diploma or license conferring the full right to practice all the branches of medicine and surgery in some foreign country, and has also studied medicine three years including three courses of lectures in different years in some legally incorporated medical college or colleges prior to the granting of said diploma or foreign license, provided that two courses of medical lectures, both of which shall be either begun or completed within the same calendar year, shall not satisfy the above requirement. Such proof shall be made, if required, upon affidavit. Upon the making of said payment and proof, the Board of Regents, if satisfied with the same, shall direct the secretary thereof to issue to said applicant an order for examination by any one of said boards of medical examiners which said applicant may elect. In case of failure at any such examination, the candidate, after the expiration of six months and within one year, shall have the privilege of a second examination by the same board to which application was first made, without the payment of an additional fee. And it is further provided that applicants examined and licensed by state examining boards of other states, on payment of \$10 to the University of this state and on filing in the office of said regents a copy of said license, certified by the affidavit of the president and secretary of such board, showing also that the standard of acquisitions adopted by said state examining board is substantially the same as is provided by sections five and six of this act, shall, without further examination, receive from said regents a license conferring on the holder thereof all the rights and privileges provided by sections eight and nine of this act.

§ 9. On and after the first day of September, 1891, no person not theretofore a legally authorized practitioner of medicine and surgery, under the laws of this State then in force, shall practice medicine or surgery in this State, unless that person shall have received from the Regents of the University, after examination and approval, as herein provided, a license to practice as a physician and surgeon, and unless said license shall have been registered as required under the provisions of chapter 647 of the laws of 1887, or unless such person shall hold a license from a state examining and licensing board of another state, and shall have been licensed by the Board of Regents, as provided by this act.

§ 10. Nothing in this act shall be construed to interfere with or punish commissioned medical officers serving in the Army or Navy of the United States or in the United States marine hospital service while so commissioned, or any one while actually serving as a member of the resident medical staff of any legally incorporated hospital, or any legally qualified and registered dentist exclusively engaged in practicing the art of dentistry, or interfere with manufacturers of artificial eyes, limbs or orthopedical instruments or trusses of any kind from fitting such instruments on persons in need thereof; or any lawfully qualified physicians and surgeons residing in other states or countries, meeting registered physicians and surgeons of this state in consultation, or any physician or surgeon residing on the border of a neighboring state, and duly authorized under the laws thereof to practice medicine or surgery therein, whose practice extends into the limits of this state; providing that such practitioner shall not open an office or appoint a place to meet patients or receive calls within the limits of the state of New York; or physicians duly registered in one county of this state, called to attend isolated cases in another county, but not residing or habitually practicing therein.

§ 11. This act shall take effect immediately.

# THE BOARD OF REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK.

ALBANY, New York. MELVIL DEWEY, Secretary.

## PRELIMINARY EDUCATION OF MEDICAL STUDENTS.

*Laws of 1889, ch. 468, as amended by laws of 1890, ch. 499.*

### TO PROVIDE FOR THE PRELIMINARY EDUCATION OF MEDICAL STUDENTS:

§ 1. Before the Regents of the University of the State of New York or the trustees of any medical school or college within this state shall confer the degree of doctor of medicine on any person, they shall require him to file with the secretary or recording officer of their university or college a certificate signed by the secretary of the University of the State of New York showing either that he possesses the degree of bachelor or master of arts, of bachelor or master of science, or of bachelor or doctor of philosophy received by him from a college or university duly authorized to confer the same, or that during or prior to the first year of his medical study within this state, he passed an examination conducted under the authority of the Regents of the University of the State of New York or by the faculty of a medical school or college entitled to confer the degree of doctor of medicine, in accordance with the standard and rules of the said regents in arithmetic, grammar, geography, orthography, American history, English composition, and the elements of natural philosophy; or in their substantial equivalents approved by the said regents, or that he possessed qualifications which the regents considered and accepted as fully equivalent to the above named qualifications.

§ 2. This act shall not apply to persons who have already entered upon the prescribed three years' study of medicine, nor shall it alter the time of study or the courses of medical instruction required to be pursued in the medical colleges of this state by existing statutes.

EXAMINATIONS, dates and subjects are arranged as follows:

March 2-6, 1891; \*New York, and about 160 academies and high schools: All subjects in groups below except conic sections, analytical geometry, surveying, mineralogy, biology, history of art, art criticism, logic, history of philosophy, pedagogy, general history, German literature, French literature.

June 8-12, 1891; New York, and 320 academies and high schools: All subjects in groups below.

GROUP 1.—*Mathematics*: Arithmetic, elementary; arithmetic, advanced; algebra, elementary; algebra, advanced; plane geometry; conic sections; solid geometry; plane trigonometry; analytical geometry; surveying.

GROUP 2.—*Science*: Geography; astronomy; physics, elementary; physics, advanced; chemistry; mineralogy; geology; physical geography; biology; botany; zoology; physiology.

GROUP 3.—*Language*: Spelling; English, elementary; rhetoric; English, advanced; English literature; German, elementary; German, advanced; German literature; French, elementary; French, advanced; French literature; Latin, elementary; Latin composition; Caesar's Commentaries; Sallust's Cataline; Ovid's Metamorph.; Virgil's Æneid; Virgil's Eclogues; Cicero's Orations; Greek, elementary; Greek composition; Xenophon's Anabasis; Homer's Illiad.

GROUP 4.—*Book-keeping*; drawing; history of art; art criticism; psychology; logic; ethics; history of philosophy; civil government; political economy; pedagogy; general history; Grecian history; Roman history; English history; U. S. history.

EQUIVALENTS ALLOWED.—1. A certificate of having successfully completed a full year's course of study in any college or university under the supervision of the Regents of the University, or registered by the regents as maintaining a satisfactory standard.

2. A certificate of having satisfactorily completed a three year's course in any institution subject to the visitation of the regents, or registered by the regents as maintaining a satisfactory academic standard.

3. A regent's diploma.

4. Regents' pass-cards for eight studies, two of which have been taken from each of the four preceding groups.

5. A regents' certificate for any ten studies. (Ordinance of the regents, adopted June 13, 1890.)

CERTIFICATES WITHOUT EXAMINATIONS.—Candidates for a medical student's certificate having the degree of bachelor or master of art, of bachelor or master of sciences, or of bachelor or doctor of philosophy, received from a college or university duly authorized to confer the same; or having credentials which, under the foregoing rules, can be accepted in place of an examination, shall send their credentials to the Examinations Department. They will be examined and returned at once, and if accepted, a medical student

---

\*Examinations will be held in the College of Physicians and Surgeons, Fifty-ninth street, New York; at the Albany medical college, Eagle street, Albany; and at the Medical Department of Syracuse University. Each candidate will be notified of any other places where there are candidates enough to grant an examination.

certificate will be sent with them. If the certificate be delayed for verification of the credentials, when issued it will be dated from receipt of credentials, so that the candidate will lose no time.

Candidates should send notice at least ten days in advance, stating at what time and in what studies they wish to be examined, that they may at once be assigned the most convenient time and place and required desk room be provided.

Candidates who fail to send this advance notice will be admitted only so far as there are unoccupied seats.

All communications must be addressed to Examinations Department, University of the State of New York, Albany, N. Y.

## REGENTS' REPORT CONCERNING THE ENDORSEMENT OF MEDICAL DIPLOMAS AND LICENSES, AND THE EXAMINATION OF MEDICAL STUDENTS FOR THE YEAR ENDING DECEMBER 1, 1890.

### 1. ENDORSEMENT OF MEDICAL DIPLOMAS AND LICENSES.

From July 1, 1890, to December 1, 1890, there have been presented for endorsement:

90 diplomas conferring degree of M.D.

4 licenses to practice medicine.

Total, 94 credentials; of which

53 have been endorsed,

2 have been refused endorsement,

7 have been returned without endorsement on request of applicants,

32 are held for applicants to comply with legal requirements.

The statistics give no adequate idea of the work which has been done by the examinations department in the endorsement of these diplomas and licenses. It has been necessary in the case of each applicant for endorsement, to examine carefully his credentials of preliminary education, and the character and standing of the schools from which they were obtained. We have required each applicant to furnish testimonials of moral character from physicians in good standing. All such testimonials presented have been investigated, and we have diligently endeavored to guard against the licensing of improper persons. Finally, the medical education of each applicant has been subjected to close scrutiny, involving much time and large correspondence.

The law requiring that a record of all endorsements must be kept, we have perfected a system of records whereby the history of each endorsement and all correspondence and documents bearing upon the case, may be obtained at the shortest possible notice. At the same time a glance at the record book will show the exact situation of each applicant for endorsement and the reasons, if any, why his credential has not been endorsed. The care that has been exercised in this work has in some cases resulted in refusal to endorse. There have been various reasons for such refusals. Some applicants were unable to meet the requirements of preliminary education. One instance of apparent attempt at fraud was discovered, the applicant claiming a medical education that he probably had not received. The diplomas of some medical schools we have declined to consider. The seven credentials returned by request were so disposed of because applicants found difficulty in meeting one or more of the requirements of the present law; thirty-two applications are now being held under consideration for the same cause. There seems to be good ground for the statement that no such careful scrutiny of foreign diplomas and licenses has heretofore existed in this state; and it may be assumed that an applicant whose credentials would have been endorsed without question under the old system would find it more difficult to obtain such endorsement to-day. Recognizing the grave responsibility placed upon it by this law, the examinations department has endeavored so to co-operate with the State Boards of Medical Examiners that the endorsement of the Regents of the University placed upon a credential should be a guarantee that its possessor is in all respects a proper person to practice medicine in the state of New York.

### 2. Examination of Medical Students.

These examinations are conducted under the authority of chapter 468, laws of 1889 as amended by chapter 499, laws of 1890. This law provides that before the trustees of any medical school or college within this state shall confer the degree of doctor of medicine on any person, they shall require such person to file with the secretary or recording officer of the college, a regents' medical student certificate. To obtain this certificate the student must, 1. Hold the degree of A. B.; A. M.; B. S.; M. S.; Ph. B., or Ph. D.; or, 2. Pass the required regents' examination; or, 3. Possess equivalent qualifications. This law took effect June 13, 1889. The following are the statistics for the years 1889-90:

Number of examinations.....	14
“ candidates examined.....	265
“ papers accepted.....	873
“ papers rejected.....	586
Total number of papers written.....	1,260
Per cent of papers rejected.....	30
Number of pass-cards written.....	873
“ certificates written.....	491
Total number of medical student certificates to date.....	508
Of which there have been issued on studies passed in special examinations 78,=13 per cent.	
On studies passed in schools (7, 8 and 10) 115,=22 per cent.	
On "equivalent qualifications" 315,=62 per cent.	



The certificates issued to applicants who presented "equivalent qualifications" makes the total number of certificates issued greatly in excess of the number of candidates admitted to the examinations.

The following table shows the increase in the medical student examination:

	Candidates.	Papers revised,	Pass-cards.	Certificates written.
1888-89 .....	47			17
1889-90 .....	265	1,260	878	491

The investigation of the "equivalent qualifications" claimed by candidates for medical student certificates, requiring the exercise of care and discretion, has materially added to the labor.

## COLLEGE OF PHYSICIANS AND SURGEONS IN THE CITY OF NEW YORK.

(Medical Department of Columbia College.)

NEW YORK CITY. GEORGE M. TUTTLE, M. D., Secretary, 437 West 59th street.

ORGANIZED in 1807, by the regents of the University of the State of New York, as their medical department, under the name of the College of Physicians and Surgeons in the City of New York. The institution was connected with the Columbia College for a short period in 1814, and became permanently connected with it in 1860, when the Medical Department of Columbia College was added to the original title. The original Medical Department of Columbia College was organized in 1767; it was suspended during the war of the Revolution, and became extinct in 1813. The first class was graduated by this college in 1811. Classes have been graduated each subsequent year.

The faculty consists of twelve professors, one adjunct professor, five clinical professors, four clinical lecturers, one demonstrator, four assistant demonstrators, five assistants to chairs, two instructors in histology, one director of laboratory, nine chiefs of clinics and forty-eight clinical assistants.

**COURSE OF INSTRUCTION:** The session of 1890-91 began October 1, 1890, and will end June 15, 1891. Instruction consists of didactic lectures with demonstrations, clinical teaching, recitations, laboratory work and practical teaching in subjects involving manipulation. Clinics at hospitals and dispensaries free to matriculates, and optional. Many special courses, fees varying from \$12 to \$25. **A three years' graded course is required.**

**Instruction embraces:** First year—Didactic lectures in: 1) anatomy; 2) physiology; 3) physics and chemistry. Practical work in: 1) dissection; 2) normal histology; 3) physiological and medical chemistry. Second year—Didactic lectures in: 1) anatomy; 2) physiology; 3) physics and chemistry; 4) materia medica and therapeutics, including hygiene; 5) pathology and practical medicine; 6) principles and practice of surgery; 7) obstetrics and gynecology. Dissection—Clinical lectures at the Vanderbilt clinic in: 1) general medicine; 2) general surgery. Practical clinical work in: 1) general medicine; 2) general surgery. Third year—Didactic lectures in: 1) materia medica and therapeutics, including hygiene; 2) pathology and practical medicine; 3) principles and practice of surgery; 4) obstetrics and gynecology; 5) ophthalmology. Clinical lectures at the Vanderbilt clinic in: 1) diseases of the mind and nervous system; 2) gynecology; 3) diseases of children; 4) genito-urinary diseases, including syphilis; 5) diseases of the skin; 6) diseases of the throat; 7) diseases of the eye; 8) diseases of the ear. Practical clinical work in the eight subjects enumerated immediately above under the head of "clinical lectures," and in obstetrics. Practical work in pathology and pathological histology.

**REQUIREMENTS:** For admission—Each candidate who did not begin the study of medicine before June 13, 1889, must show a certificate of satisfactory examination in preliminary education before the Board of Regents of the University of the State of New York.

See "Preliminary Education of Medical Students" in New York, page 103.

**For graduation:** I.—A. Candidates who are not already graduates in medicine of recognized institutions must have pursued the regular three years' curriculum at this college; or the regular curriculum of the second and third years at this college, and such a course at some other medical school as shall have been recognized by the faculty as an equivalent for the first year's curriculum at this college. No course at another medical school will be so recognized, which shall have been begun during the same calendar year as that in which the student who shall have attended it shall have entered this college. B. Graduates in medicine of recognized institutions must have pursued at this college at least the regular curriculum of the third year. II.—All candidates, whether already graduates in medicine or not, must pass at this college examinations satisfactory to the faculty in 1) anatomy; 2) physiology; 3) physics and chemistry; 4) materia medica and therapeutics, including hygiene; 5) pathology and practical medicine; 6) principles and practice of surgery; 7) obstetrics and gynecology; 8) clinical studies. III.—Candidates must present satisfactory evidence of good moral character, and of having attained the age of twenty-one years. IV.—Candidates must have studied medicine thirty-six months under the direction of a regular practitioner or practitioners of medicine. The three years of medical study with a

preceptor include the time spent in attendance upon medical schools, and must be exclusive of any time spent as an under-graduate at a non-medical institution; but the two years' course styled "Preparatory to the Study of Medicine," at the Cornell University, the Sheffield Scientific School of Yale University, or the Johns Hopkins University, the College of New Jersey, or the University of Wisconsin, is accepted in place of six months' study with a preceptor, in the case of a student who afterwards attends three sessions at this college. The phrase "regular practitioner or practitioners" is used in the sense commonly understood in the medical profession. Certificates of preceptorship from eclectic, homeopathic, or other so-called "irregular" practitioners will not be received, even if such practitioners be graduates of regular medical schools. The examinations for the degree of Doctor of Medicine are in writing, and are held twice a year, viz.: 1) immediately after the close of the lectures of the college year in June; 2) during the early part of October.

**FEES:** First year—Matriculation, \$5; fee for all the required exercises of the year, \$200; anatomical material, \$1 each part. Second year—Matriculation, \$5; fee for all the required exercises of the year, \$200; anatomical material, \$1 each part. Third year—Matriculation, \$5; fee for all the required exercises of the year, \$200; graduation fee, \$30; fees for special students, \$10 to \$25 per branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	555	120	21.6
1881-82	547	115	21
1882-83	543	125	23
1883-84	505	105	20.7
1884-85	439	134	30.5
1885-86	458	97	21.1
1886-87	543	106	19.5
1887-88	755	115	15.2
1888-89	676	166	24.5
1889-90	589*	179	30.3

Percentage of graduates to matriculates for past ten years, 22.4.

## COLLEGE OF PHYSICIANS AND SURGEONS OF THE WESTERN DISTRICT OF NEW YORK.

FAIRFIELD, N. Y.

ORGANIZED in 1812.—Extinct since 1840. Had 3,123 students, and graduated 589.

## NEW MEDICAL INSTITUTION.

(*Medical Department of Queen's College, New Jersey.*)

NEW YORK CITY.

ORGANIZED in 1814; suspended in 1816. In 1826 it was revived, but became extinct again in 1830. It is probable that the diplomas issued after its revival were illegal.

## NEW YORK SCHOOL OF MEDICINE.

NEW YORK CITY.

ORGANIZED under the auspices of the New York County Medical Society in 1831.

## NEW YORK REFORMED MEDICAL COLLEGE.

(*Eclectic.*)

NEW YORK CITY.

ORGANIZED in 1836.—Extinct, 1838.

---

\*Not including thirty graduates who matriculated.

## AUBURN MEDICAL SCHOOL.

AUBURN, N. Y.

EXTINCT.—Date of organization and extinction unknown.

## ALBANY MEDICAL COLLEGE.

*(Medical Department of Union University.)*

ALBANY, N. Y. WILLIS G. TUCKER, M. D., Registrar, 4 Lancaster street.

ORGANIZED in 1838. Incorporated and graduated its first class in 1839. It became connected with the Union University in 1873, when the present title was assumed.

The faculty consists of thirteen professors, one demonstrator, one assistant demonstrator, two lecturers, twelve instructors, and eight assistants to chairs.

COURSE OF INSTRUCTION: The regular graduating session of 1890-91 began September 23, 1890, and will close April 1, 1891. Written examinations are held monthly; clinics at hospitals and dispensary.

**Three graded courses of lectures are now and will hereafter be an essential pre-requisite for graduation.**

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, histology, toxicology, orthopedics, medical jurisprudence, dermatology, psychological medicine, ophthalmology and otology, diseases of children, diseases of the nose, throat and chest, and diseases of the nervous system, insanity, physics. Recitations are now made a part of the regular curriculum.

REQUIREMENTS: For admission—1) certificate from the Secretary of the Board of Regents of the University of the State of New York of possessing a degree in arts, science or philosophy from a college or university duly accredited; 2) certificate of preliminary examination in branches of an English education, conducted under the authority of the Regents of the University of the State of New York; 3) qualifications which the Regents have considered as fully equivalent to the above named qualifications. See "Preliminary Education of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study after the age of eighteen years; 4) **"three years' graded course in this college or the equivalent of the first two courses elsewhere and the last in this college,"** except as hereafter provided; 5) thesis; 6) "satisfactory examination in the several branches of medicine and surgery; final examination being conducted chiefly in writing;" 7) regular and punctual attendance is required; 8) compliance with the law concerning preliminary examinations.

FEEs: Matriculation, \$5; lectures, \$100; demonstrator, \$10; graduation, \$25; perpetual ticket, \$150; laboratory fee, chemistry, histology, pathology, each \$10.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	172	58	33.7
1881-82	170	54	31.7
1882-83	157	51	32.5
1883-84	149	43	28.8
1884-85	142	33	23.2
1885-86	142	40	28.1
1886-87	144	37	25.6
1887-88	132	37	28
1888-89	136	41	30.1
1889-90	148	37	25

Percentage of graduates to matriculates for past ten years, 28.9.

## GENEVA MEDICAL COLLEGE.

GENEVA, N. Y.

ORGANIZED in 1839.—Extinct. See *College of Medicine of Syracuse University*.

## UNIVERSITY OF THE CITY OF NEW YORK, MEDICAL DEPARTMENT.

*University Medical College.*

NEW YORK CITY. CHARLES INSLEE PARDEE, M. D., Dean, 410 E. Twenty-sixth street.

ORGANIZED in 1841. First class was graduated in 1842. Classes have been graduated each subsequent year.

The faculty consists of eleven professors, eight clinical professors, four adjunct professors, sixteen instructors, one demonstrator, one assistant demonstrator, thirteen clinical assistants and five lecturers.

**COURSE OF INSTRUCTION:** The collegiate year is divided into three sessions; a preliminary term, which began September 24, 1890, and continued until September 30, 1891; the regular winter course then began, and will continue to the 25th of March, 1891, to be followed by a spring session of ten weeks immediately thereafter. Instruction consists of didactic and clinical lectures, recitations, practical demonstrations of subjects involving manipulation and practice at the bedside and in the laboratories. Regular recitations are held in the evening every week by the faculty. There are a number of private courses given in special branches.

Lectures embrace anatomy, physiology, chemistry and physics, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, and gynecology, diseases of children, hygiene, medical jurisprudence, ophthalmology, otology, orthopedic surgery, dermatology, mental diseases, bacteriology and psychology, laryngology and electro-therapeutics.

**REQUIREMENTS:** For admission: None from those who began the study of medicine before June 13, 1889. From those who began after that date, a certificate from the Secretary of the Board of Regents of the University of the State of New York, in regard to qualifications of preliminary education will be necessary. See "Preliminary Education of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) "two winter sessions of lectures;" 4) three years' study; 5) one course of practical anatomy; 6) satisfactory written examinations on surgery, chemistry, practice of medicine, materia medica, anatomy, physiology and obstetrics. Rejected candidates will not be permitted to apply for a re-examination for one year. Honorary degrees are not granted. Two commencements take place annually, at either of which the candidates who have complied with the above requirements may graduate; the first is at the close of the winter, the second, at the close of the spring session.

**FEES:** Matriculation, \$5; lectures, \$140; demonstrator, \$10; graduation, \$30; private instruction in practical branches, averaging \$12 per course; single tickets, \$20 each branch, entrance fee, laboratory courses, \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	623	200	32.1
1881-82	575	213	37.
1882-83	528	163	30.8
1883-84	526	164	31.1
1884-85	533	175	32.8
1885-86	547	173	31.6
1886-87	605	151	24.9
1887-88	634	163	25.7
1888-89	606	179	29.5
1889-90	613*	159	25.9

Percentage of graduates to matriculates for past ten years, 30.

**Beginning with the session of 1891-92 candidates for graduation, excepting those who matriculated prior to June 13, 1889, will be required to have attended three full winter courses of lectures.**

## MEDICAL DEPARTMENT OF THE UNIVERSITY OF BUFFALO.

BUFFALO, N. Y. CHARLES CARY, M. D., Secretary, 340 Delaware avenue.

ORGANIZED in 1846. First class was graduated in 1847. Classes have been graduated each subsequent year.

The faculty consists of twelve professors, six clinical professors, one demonstrator, one assistant demonstrator, one lecturer and one pathologist. The spring faculty consists of six lecturers.

\* Not including twenty graduates who

**COURSE OF INSTRUCTION:** The regular term of 1890-91 began September 22, 1890, and will continue six months. The spring course begins the first Monday after commencement, March 30, 1891, and continues eight weeks. The course of instruction includes scholastic and clinical teaching, with systematic recitations and special instructions. A three years' graded course is recommended, but not required. Women admitted upon same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, clinical medicine, obstetrics and gynecology, hygiene, medical jurisprudence, toxicology, ophthalmology and otology, psychological medicine, dermatology and microscopy, genito-urinary and venereal diseases, nervous diseases, diseases of children, orthopedic surgery, laryngology and clinical surgery.

**REQUIREMENTS:** For admission—"A certificate from the secretary of the Board of Regents of the University of the State of New York, in regard to qualifications of preliminary education." See "Preliminary Education of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) "dissection of the entire subject, either here or elsewhere;" 5) two full courses of lectures; 6) satisfactory examination in the several departments; 7) thesis; 8) one laboratory course in pathology and chemistry.

**After the session of 1890-91, attendance on three full courses of lectures will be necessary for graduation, and a satisfactory examination in the pharmaceutical laboratory will be added to the requirements for graduation.**

**FEEs:** Matriculation, \$5; lectures, \$100; demonstrator, \$10; graduation, \$25; chemical, pharmaceutical and pathological laboratory, obligatory, \$25; perpetual ticket, \$150.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	154	48	31.1
1881-82	172	65	37.8
1882-83	178	57	32.
1883-84	155	62	40.
1884-85	134	48	35.8
1885-86	132	43	32.5
1886-87	160	50	31.2
1887-88	163	44	26.1
1888-89	189	46	24.3
1889-90	218*	52	23.8

Percentage of graduates to matriculates for past ten years, 31+.

#### ROCHESTER ECLECTIC MEDICAL COLLEGE.

ROCHESTER, N. Y.

ORGANIZED in 1848. Lectures delivered during three or four sessions.—Extinct, 1852.

#### CENTRAL MEDICAL COLLEGE OF NEW YORK.

(*Eclectic.*)

SYRACUSE, N. Y.

ORGANIZED in 1843.—Extinct, 1855.

#### SYRACUSE MEDICAL COLLEGE.

(*Eclectic.*)

SYRACUSE, N. Y.

ORGANIZED in 1849.—Extinct, 1855.

---

\*Not including one graduate who matriculated.

## NEW YORK MEDICAL COLLEGE.

NEW YORK CITY.

ORGANIZED in 1852. The last session was held in 1863-64.

## MEDICAL COLLEGE OF NEW YORK CITY.

NEW YORK CITY.

EXTINCT.

## EXCELSIOR MEDICAL COLLEGE.

NEW YORK CITY.

EXTINCT.

## METROPOLITAN MEDICAL COLLEGE.

*(Eclectic.)*

NEW YORK CITY.

ORGANIZED in 1852; incorporated March, 1857, charter repealed April 12, 1862.—Extinct.

## HYGIEO-THERAPEUTIC COLLEGE OF NEW YORK.

NEW YORK CITY.

CHARTERED, 1856.—Extinct, 1866.

## LONG ISLAND COLLEGE HOSPITAL.

BROOKLYN, N. Y. J. H. RAYMOND, M. D., Secretary of the Faculty, Henry street,  
between Pacific and Amity streets.

INCORPORATED in 1858. First class was graduated in 1860; classes have been graduated each subsequent year.

Faculty consists of eleven professors. There are seven professors of special subjects, one adjunct professor, one demonstrator of anatomy, and nineteen assistants to the various chairs; twelve lecturers attend during the reading and recitation term.

COURSE OF INSTRUCTION: The collegiate year is divided into a regular term and a reading term; the former for the session of 1890-91, began September 24, 1890, and continues until March 12, 1891. The reading term will begin March 13, 1891, and end June 5, 1891. A graded course extending over two collegiate years of eight and a half months each, is recommended, but not required. It is also recommended that where possible the student spend three years at college work.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, laryngology, toxicology, ophthalmology, and otology, diseases of children, dermatology, diseases of the mind and nervous system, and genito-urinary diseases, histology, clinical medicine and clinical surgery, bacteriology, practical obstetrics.

REQUIREMENTS: For admission. A certificate of sufficient preliminary qualifications from the Secretary of the Board of Regents of the University of the State of New York. See "Preliminary Education of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three full years' study; 4) two full courses of lectures, not completed in the same twelve months; 5) practical anatomy, to the extent of having dissected each region of the body; 6) one course of practical chemistry and urine analysis; 7) one practical laboratory course in normal and pathological histology; 8) pass satisfactory examinations in chemistry and urine analysis, histology, anatomy, and pathological anatomy, physiology, materia medica, therapeutics, gynecology, obstetrics, surgery, operative and clinical surgery and practice of medicine.

**FEES:** Matriculation, \$5; demonstrator, \$5; chemical laboratory, \$10; Hoagland pathological laboratory, \$10; lectures, \$100; reading term, \$40; graduation, \$25; single tickets, \$10 to \$17, each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	141	51	36.1
1881-82	159	61	38.3
1882-83	154	51	33.4
1883-84	122	37	30.3
1884-85	119	47	39.4
1885-86	109	49	44.9
1886-87	99	30	30.3
1887-88	134	36	26.8
1888-89	143	46	32.1
1889-90	197*	55	27.9

Percentage of graduates to matriculates for past ten years, 33.6.

### NEW YORK HOMEOPATHIC MEDICAL COLLEGE.

NEW YORK CITY. L. L. DANFORTH, M. D., Secretary, 149 W. Forty-fourth street.

**ORGANIZED** in 1860. First class was graduated in 1861. Classes have been graduated each subsequent year.

The faculty consists of twenty-one professors, one assistant professor, one clinical professor, three lecturers, seven clinical assistants, two demonstrators and one instructor.

**COURSE OF INSTRUCTION:** The session of 1890-91 opened October 1, 1890, and terminates April 9, 1891. **The course of instruction is graded** and provision is made for three classes of students—a junior, a middle and a senior class. Preliminary course began September 15, and ended October 1, 1890.

Lectures embrace anatomy, physiology, chemistry and toxicology, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, medical jurisprudence, hygiene and sanitary science, diseases of the heart and lungs, diseases of children, laryngology and rhinology, mental and nervous diseases, ophthalmology and otology, orthopedic surgery, dermatology and genito-urinary diseases, histology, microscopy, diseases of the kidney, pharmacutics, and laboratory drill.

**REQUIREMENTS:** For admission—"From those who began the study of medicine after June 13, 1889, a certificate from the Secretary of the Board of Regents of the University of the State of New York, in regard to qualifications of preliminary education, will be necessary."

See "Preliminary Education of Medical Students" in New York, page 103.

For graduation; 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) **three full courses of lectures**; 5) one course of practical anatomy; 6) satisfactory written examination in each department; 7) compliance with the state law in regard to qualifications of preliminary education.

**FEES:** Matriculation, \$5; lectures, \$100; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates,	Graduates.	Percent.
1880-81	165	54	32.7
1881-82	146	36	24.6
1882-83	145	47	32.4
1883-84	153	53	34.6
1884-85	130	40	30.7
1885-86	138	41	29.7
1886-87	141	46	32.6
1887-88	133	48	36+
1888-89	127	37	29.1
1889-90	118†	38	32.2

Percentage of graduates to matriculates or past ten years, 31.5.

**For requirements of the American Institute of Homeopathy as to admission and graduation in 1892, see Introductory Remarks.**

\*Not including four graduates who matriculated.

†Not including four graduates who matriculated.

# BELLEVUE HOSPITAL MEDICAL COLLEGE.

NEW YORK CITY. AUSTIN FLINT, M. D., LL. D., Secretary of the Faculty.

ORGANIZED in 1861. First class was graduated in 1862. Classes have been graduated each subsequent year.

The faculty consists of nine professors, seven professors of special departments, two lecturers, two demonstrators, twenty-four assistants to chairs, and prosectors. Members of the faculty and others, to the number of twenty-three, give instruction during the spring term.

**COURSE OF INSTRUCTION:** The collegiate year is divided into two sessions. The winter session of 1890-91 began September 24, 1890, and continuing twenty-six weeks will close about the middle of March, 1891. The spring session will begin the latter part of March, 1891, and continue until the middle of June. Attendance upon three courses of lectures is recommended, but not required, and provision is made for the examination of those pursuing this plan. Hospital clinics are numerous. Regular weekly quizzes are held by members of the faculty upon the subjects of the lectures; these examinations are confined to candidates for graduation.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, orthopedic surgery, ophthalmology and otology, cutaneous and genito-urinary diseases, diseases of children, toxicology, diseases of the throat, diseases of the mind and nervous system. Private courses on practical subjects are given by the faculty and instructors; average fee, \$20. Private rooms in laboratory \$5 to \$10 per month.

**REQUIREMENTS:** For admission—None for those who began the study of medicine before June 13, 1889; from those who began after that date, a certificate from the secretary of the Board of Regents of the University of the State of New York, in regard to qualifications of preliminary education, will be necessary.

See "Preliminary Examination of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) proper testimonials of character; 3) three years' study; 4) two full courses of lectures; 5) satisfactory examination in each of the seven departments of instruction, viz.: practice of medicine, surgery, obstetrics, materia medica and therapeutics, physiology, anatomy and chemistry—the examinations upon practice of medicine and surgery include diseases of the nervous system, pathological anatomy, ophthalmology and otology, genito-urinary surgery, syphilology and dermatology; 6) one course of practical anatomy; 7) one course of normal and pathological histology and microscopical examination of urine.

**Beginning with the session of 1891-92, three courses of lectures will be required for graduation of all excepting those candidates who matriculated prior to June 13, 1889.**

**FEES:** Matriculation, \$5; lectures, \$140; demonstrator, \$10; pathological laboratory, \$10; graduation, \$30; single tickets, \$20 each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	379	118	31.1
1881-82	480	163	33.9
1882-83	467	167	35.7
1883-84	431	149	34.3
1884-85	365	134	36.7
1885-86	386	139	36+
1886-87	401	134	33.4
1887-88	365	144	39.4
1888-89	409	138	33.7
1889-90	486*	144	29.6

Percentage of graduates to matriculates for past ten years, 34.2.

Names of matriculates not given in announcement.

## NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN.

(Homeopathic.)

NEW YORK CITY. M. BELLE BROWN, M. D., Secretary, 135 West 34th street.

ORGANIZED in 1863. First class was graduated in 1864. Classes have been graduated each subsequent year.

The faculty consists of fifteen professors, three adjunct professors, three lecturers and a demonstrator.

**COURSE OF INSTRUCTION:** The regular session of 1890-91 began October 1, 1890, and continues twenty-six weeks. **The curriculum of studies extends over a three-years' graded course,** and is arranged as follows: "First year—theoretical and inorganic

\*Not including thirty-three graduates who matriculated.



chemistry, physiology, general and descriptive anatomy, histology, hygiene, dissections and laboratory work will be obligatory on all students of this year. Second year—organic chemistry with toxicology, histology, pathological anatomy, physiology, anatomy, hygiene, materia medica, surgery, gynecology, diseases of children, obstetrics, pathology and practice of medicine. Students of this year are expected to finish their dissections to the satisfaction of the professor of anatomy; they will also be required to attend the lectures on ophthalmology and otology, diseases of the chest, medical jurisprudence and mental and nervous diseases, but will not be subject to quizzes in these branches. Third year—continuation of pathology and practice of medicine, materia medica, obstetrics, gynecology, diseases of children, surgery, ophthalmology and otology, diseases of the chest, medical jurisprudence, pathological anatomy, mental and nervous diseases. During the year students are required to attend the various clinics of the college. Each student will also be required to take charge of obstetrical cases." Actual attendance on lectures is required.

**REQUIREMENTS:** For admission—"Applicants for matriculation are required to give satisfactory testimony of moral character, together with proof of having arrived at the age of eighteen years; they must present a certificate from the Secretary of the Board of Regents of the University of the State of New York of proper preliminary qualifications." See "Preliminary Examinations of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) three full years' study; 3) **three complete courses of lectures**; 4) thesis; 5) satisfactory course of dissections; 6) satisfactory examinations both before the faculty and the board of censors.

**FEES:** Matriculation, paid but once, \$5; laboratory fee, \$5; lectures, per session, \$75; demonstrator, \$10; demonstration in histology, \$5; graduation, \$30; single tickets, \$15, each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1884-85	30	13	43.3
1885-86	39	13	33.3
1886-87	27	10	37+
1887-88	42	9	24.4
1888-89	32	5	15.6
1889-90	36	15	41.6

Percentage of graduates to matriculates for past six years, 31.5.

Name of matriculates not given in announcement.

**For requirements of the American Institute of Homeopathy in regard to admission and graduation in 1892, see Introductory Remarks.**

## ECLECTIC MEDICAL COLLEGE OF THE CITY OF NEW YORK.

NEW YORK CITY. GEORGE W. BOSKOWITZ, M. D., Dean 239 East Fourteenth street.

**ORGANIZED IN 1865.** The first class was graduated in 1886; classes have been graduated each subsequent year.

The faculty consists of eight professors, eleven lecturers, one instructor and one assistant to chair of chemistry, one demonstrator.

**COURSE OF INSTRUCTION:** The thirtieth annual session began September 16, 1890, and will continue six months; clinics in hospital and dispensary. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics diseases of women and children, medical jurisprudence, toxicology, diseases of the eye, ear, throat and skin, nervous diseases and insanity, hygiene, electro-therapeutics, histology, pharmacy, medical and surgical clinics.

**REQUIREMENTS:** For admission—"Candidates for matriculation must be at least eighteen years old, and must present satisfactory testimonials of moral character from former instructors or physicians in good standing. Students who began the study of medicine after June 13, 1889, must present certificates of proper preliminary education signed by the Secretary of the Board of Regents of the University of the State of New York." See "Preliminary Examination of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) **four years' study** under the supervision of a reputable physician; 3) **three full terms of instruction**; 4) a thesis on some medical subject.

**FEES:** Matriculation, \$5; lectures, \$100; demonstrator, \$10; analytical chemistry, \$5; pathological laboratory, \$5; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	215	64	29.7
1881-82	146	50	34.2
1882-83	131	37	28.2
1883-84	96	19	19.7
1884-85	45	11	24.4
1885-86	74	15	20.2
1886-87	92	15	16.3
1887-88	58	11	18.9
1888-89	75	12	16.
1889-90	77*	12	15.5

Percentage of graduates to matriculates for the past ten years, 24.3.

**NOTE:**—With the session of 1890-91 a graded course was inaugurated, and three years' attendance on lectures and four years' study of medicine required.

## BROOKLYN ACADEMY OF MEDICINE.

BROOKLYN, N. Y.

(Auxillary to the Eclectic Medical Society of N. Y.) Incorporated April 24, 1866. Charter revoked about 1880.

## WOMAN'S MEDICAL COLLEGE OF THE NEW YORK INFIRMARY.

NEW YORK CITY. EMILY BLACKWELL, M. D., Dean, 128 Second avenue.

**ORGANIZED** in 1868. First class was graduated in 1870. Classes have been graduated each subsequent year.

The faculty consists eight professors, six clinical professors, two lecturers, two demonstrators, one assistant demonstrator and five instructors.

**COURSE OF INSTRUCTION:** "The college year is divided into two terms of four months each, and half of the studies appropriate to the year are allotted to each of these terms. The first term lasts from October 1 to January 25. The second from January 27 to May 15. The course of study required to render a student eligible for graduation covers three college years. Those students who wish to do so, may, however, divide the second of their three years into two, thus completing their course in four years.

**Division of studies:** "First year—Anatomy, chemistry, physiology, materia medica and histology; students will also dissect and work in the pharmaceutical, chemical and histological laboratories. Second year—Anatomy, physiology, pathological anatomy, practice, surgery, obstetrics, therapeutics and hygiene. Third year—Practice, pathological anatomy, surgery, gynecology, obstetrics and therapeutics; clinical instruction in diseases of children, eye and ear, the nervous system, and orthopædics. During this year each student enjoys the privilege of attending upon ten cases of obstetrics in the infirmary wards; of witnessing operations at the infirmary, as also at other hospitals in the city, and may listen to the clinical lectures at Bellevue." Each professor quizzes on his own lectures, and an instructor is attached to each chair to assist in quizzing. Class examinations held at the end of each college year.

**REQUIREMENTS:** For admission—Certificate signed by Secretary of the Board of Regents of the University of the State of New York, of compliance with State examination required by the Act of Legislature of 1889. "All students are required besides to show a competent knowledge of German or French, or an elementary knowledge of Latin; also the elements of botany and chemistry as found in science primers." See "Preliminary Education of Medical Students" in New York, page 103.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) must give evidence of having studied medicine during three years, have spent at least one continuous year at this school (if only one this must be the last year); 4) a thesis on some medical subject; 5) satisfactory examinations before the faculty will also be required.

**FEES:** Matriculation, \$5; professors tickets, \$80 first year, \$140 second year, \$60 third; demonstrator's, \$10 first and second year, each; laboratory fees, \$24 first year, \$5 second; material, \$10 first year; practical obstetrics \$5, operative surgery, \$5; clinical fee, \$10; reading room, 50 cents per year; graduation \$30. Students sent by missionary boards for education for missionary work are charged half price except for matriculation, graduation and laboratory fees.

\* Not including five matriculates who did not attend, and three graduates who matriculated.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	60	8	13.3
1881-82	49	10	20.4
1882-83	40	5	12.5
1883-84	40	9	22.5
1884-85	33	11	33.3
1885-86	34	8	23.5
1886-87	42	8	19+
1887-88	52	4	7.6
1888-89	68	10	14.7
1889-90	80	20	25.

Percentage of graduates to matriculates for past ten years, 18.7.

## NEW YORK FREE MEDICAL COLLEGE FOR WOMEN.

NEW YORK CITY.

ORGANIZED in 1871.—Extinct, 1877.

## COLLEGE OF MEDICINE OF SYRACUSE UNIVERSITY.

SYRACUSE, N. Y. W. H. DUNLAP, M. D., Registrar, 408 East Genesee street.

ORGANIZED in 1872, as the College of Physicians and Surgeons of Syracuse University. In 1875 assumed its present title. The Geneva Medical College, organized in 1836, was merged into this institution. The first class was graduated in 1873. Classes have been graduated each subsequent year.

The faculty consists of fifteen professors, five lecturers and two instructors, one demonstrator and one assistant demonstrator.

**COURSE OF INSTRUCTION:** The college year begins the first Tuesday in October, ends on the second Tuesday in June, and is divided into two terms. **Attendance at college during a three years' graded course required.** Students are divided into three classes, according to their proficiency and time of study. Studies—"First year: anatomy, physiology, chemistry, histology and materia medica. Second year: anatomy, physiology, medical chemistry, materia medica, surgery, practice and clinics. Third year: therapeutics, practice surgery, medicine, histology, obstetrics, pediatrics, pathology, gynecology, forensic and state medicine, ophthalmology, dermatology and clinics." Written and oral examinations are frequent and thorough. Women admitted upon the same terms as men.

**REQUIREMENTS:** For admission—All students who join the school for the regular course who did not begin the study of medicine before June 13, 1889, are required to exhibit evidence of, 1) satisfactory examination in preliminary education by the Board of Regents of the University of the State of New York. For full information concerning this examination apply to the Secretary of the Board of Regents, Albany, N. Y.; 2) in addition to the State examination students will be examined in the following subjects: a) Algebra through simple equations as treated in Wentworth's complete algebra, or its equivalent; b) Geometry, first book of Wentworth's "Elements of Geometry," or its equivalent; c) Latin: the translation of a passage selected from one of the first four books of "Caesar's Commentaries," and questions relating to the grammar of the passage; an equivalent from another Latin author may be substituted if desired. [Arrangements have been made by which candidates not prepared in Latin will receive instruction in this language, without extra expense and without interfering with medical studies.] These examinations are in writing.

Regent's certificates are accepted for the studies which they cover. Candidates who pass all the requirements for entrance are admitted unconditionally. Those who fail in two subjects are admitted conditionally. Candidates who are conditioned are allowed to enter the classes with the other students, but are ranked unclassified until they have passed in the studies in which they were conditioned. Candidates rejected or conditioned can be re-examined at any of the June annual examinations by giving due notice to the Registrar of the intention to do so, or, without notice, at the yearly entrance examinations, the first Tuesday of October. See "Preliminary Examination of Medical Students" in New York, page 108.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three years' course**, the last of which, at least, must have been spent in this school; 4) satisfactory examinations.

**FEES:** Matriculation, \$5; lectures for the year, \$80; anatomical laboratory, \$10; graduation, \$25; single tickets, \$18 each branch, per term.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	60	20	33.3
1881-82	45	11	24.4
1882-83	44	12	27.2
1883-84	46	11	23.9
1884-85	58	11	29.
1885-86	41	11	26.8
1886-87	37	9	24.3
1887-88	20	9	45.
1888-89	39	4	10.2
1889-90	48	9	18.7

Percentage of graduates to matriculates for past ten years 25.5.

## UNITED STATES MEDICAL COLLEGE.

(Eclectic.)

NEW YORK CITY.

ORGANIZED in 1878. Illegal.—Extinct since 1882. **Diplomas not recognized.**

## COLLEGE OF PHYSICIANS AND SURGEONS OF BUFFALO.

BUFFALO, N. Y. Extinct.

ORGANIZED in 1879. Illegal. The first class was graduated in 1880. No class graduated in 1882. **Diplomas not recognized.**

## MEDICAL DEPARTMENT OF NIAGARA UNIVERSITY.

BUFFALO, N. Y. A. A. HURRELL, M. D., Secretary, 212 Franklin street.

ORGANIZED in 1883. The faculty consists of twelve professors, five lecturers, one demonstrator, one adjunct professor and three assistants.

**COURSE OF INSTRUCTION:** The eighth regular course of lectures began September 22, 1890, and will continue until April 14, 1891. **The time of study required is three years, including three full terms of medical lectures of seven to eight months each, and an extension to four years is earnestly recommended.** Recitations will occupy a prominent place in the teaching methods of this school; clinical lectures and laboratory work, also.

**Division of studies:** First year—general chemistry, materia medica, pharmacy, histology, anatomy, physiology, dissections, laboratory work. Examinations at the end of the year in general chemistry, materia medica and pharmacy and in part in anatomy. Second year—medical chemistry, anatomy, physiology, pathology, pharmacology, hygiene, obstetrics, principles and practice of medicine, principles and practice of surgery, dissections, laboratory work, clinics. Examinations at the end of the year in medical chemistry, anatomy (completed), physiology (completed), pathology, pharmacology, obstetrics in part, general medicine and general surgery. Third year—therapeutics, surgical anatomy, principles and practice of medicine, principles and practice of surgery, obstetrics, diseases of children, diseases of women, diseases of the eye, ear and throat, diseases of the skin, diseases of the nervous system and insanity, medical jurisprudence; clinical instruction in each department. Examinations at the end of the year for the degree. Students who have attended one full course of lectures elsewhere will be admitted to the second year of this school, after passing examinations of the first year's studies.

**REQUIREMENTS:** For admission—"Students desiring to be admitted to this school must comply with the law of the state of New York in regard to the preliminary educational qualification". In addition to the above students will be required to give evidence of good moral character and to pass an examination by the faculty in Latin, including its elements as comprehended in Arnold's "First Latin Book," or its equivalent. Those not possessing the required amount of Latin may enter conditionally upon their qualifying themselves before the beginning of the second year."

See "Preliminary Education of Medical Students," in New York, page 103.

**For graduation:** 1) twenty-one years of age and must have studied medicine at least three years; 2) a good moral character; 3) **at least three full courses of medical lectures**; 4) completion of the curriculum of this school; 5) attendance on two or more obstetric cases; 6) satisfactory final examinations before the faculty and board of examiners.

**FEES:** Matriculation, \$5; demonstrator, \$16; perpetual ticket, \$165; lectures, \$75; graduation, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	13	—	—
1884-85	23	—	—
1885-86	35	6	17.1
1886-87	37	4	10.8
1887-88	49	12	24.4
1888-89	45	8	18.6
1889-90	49	16	32.6

Percentage of graduates to matriculates for past five years, 21.5.

## THE AMERICAN COLLEGE OF ARTS AND SCIENCES, OF THE STATE OF NEW YORK.

120 Pearl street, Buffalo, N. Y.

"The instruction at this College and its co-operative regional Colleges, Universities, academies and institutions of learning, on the American Continent, comprehends every department of learning for which the candidate desires a diploma. Students of all professions or callings of distinction, can matriculate, and have instruction in any department at their home under a special instructor by appointment, or at any of our institutions of learning in the Western Hemisphere, and upon presentation of certificates of proficiency will be entitled to degrees in their specialty.

"Graduates of other colleges, who desire a degree for any specialty, may obtain the same upon presentation of certificates of proficiency. Educated men and women (self-made), professors and practitioners in any department of the arts and sciences will receive their degrees upon passing the required examination, under the laws, rules and regulations of the institution.

"Regional professors are appointed in every city, town and village on the American Continent to examine candidates.

"FEES: Matriculation ticket, \$5; full course ticket, in any department, including examination, \$50; special examinations at reasonable charges; no fees are charged for diploma; the imposition of such fees is repugnant to Druidic law and usage."

### Diplomas not recognized.

## THE DRUIDIC BANCHOREION.

120 Pearl street, Buffalo, N. Y.

"An incorporated college for training candidates in literature, philosophy, sciences, arts, law, reformed medicine and all other professions of distinction. Degrees granted to those furnishing evidence of proficiency for any specialty. The medical staff is composed of skillful physicians, surgeons and specialists.

"No fees are charged for diploma; the imposition of such fees is repugnant to Druidic law and usage."

Two diplomas of this institution were offered to the Board of Medical Examiners of Montana, for the purpose of obtaining license to practice medicine, but were not accepted.

Several diplomas of this concern are registered in New Jersey.

The rector of both these institutions is a graduate of the Druidic University, of Lewistown, Maine, in 1836, an institution whose charter was annulled by the legislature of that State for irregularities in granting diplomas. He is also the proprietor and physician of the Medical and Surgical Institute and Sanitarium, located at 120 Pearl street, Buffalo.

NOTE:—In the exposure made by the Boston *Herald* of the work of Dr. Bradbury, of Nashua, N. H., who was fined and imprisoned for using the mails fraudulently, in connection with obtaining diplomas, allusion is made "to an institution in the State of New York from which he could obtain the desired article."

### Diplomas not recognized.

## NORTH CAROLINA.

### BOARD OF MEDICAL EXAMINERS OF NORTH CAROLINA.

LITTLETON, N. C. L. J. PICOT, M. D., Secretary.

INCORPORATED 1859. The Board of Medical Examiners of the State of North Carolina is a body separate and distinct from the State Board of Health—its duty being to examine all applicants for license to practice medicine or surgery, or any of the branches thereof, in the State. It is composed of seven members, who are elected by the State Medical Society, and who serve for a period of six years. Its powers are derived from acts of the Legislature, which have been amended at different times since the year 1859, when the first act creating

a Board of Medical Examiners was passed. No penalty originally attached to the failure to comply with the provisions of this act, except inability to collect a medical bill by law. In the year 1885, an amendment was passed fixing the penalty at a minimum of twenty-five or a maximum of one hundred dollars, or imprisonment for each and every offense.

In the year 1888 another amendment was passed, requiring *all* physicians to be registered by the clerk of the Superior Court, and *after the first day of January, 1890*, all persons who *begin* the practice of medicine in North Carolina, must within 30 days after obtaining a license from the Board of Medical Examiners, be registered by the clerk of the Superior Court.

Each applicant for license must give written evidence that he is of good moral character and twenty-one years of age; must submit to a written examination in 1) surgery and surgical pathology and diseases of the eye and ear; 2) chemistry and pharmacy; 3) anatomy; 4) physiology and medical hygiene; 5) materia medica and therapeutics; 6) obstetrics and diseases of women and children; 7) practice of medicine and medical pathology. Applicants must answer seventy per cent. of all the questions satisfactorily.

Temporary licenses may be issued in the interim between the regular annual meetings, by any two members of the Board, to hold good only until the next annual meeting thereafter. The fee for temporary license is \$5; for permanent license, \$10.

The annual meetings are held at the same time and place as those of the State Medical Society. The last meeting was held in May, 1890, in Oxford, North Carolina. There were 72 applicants for licenses; 46 were licensed, and 26 were refused license. The next annual meeting will be held in Asheville, North Carolina, May, 1891, at which time the new Board elected in 1890 will hold its first annual meeting.

Below will be found some interesting statements which have been tabulated for easy reference, showing some of the work of the Board from 1885 to 1890—both years included:

INSTITUTIONS REPRESENTED BY THE APPLICANTS BEFORE THE BOARD OF MEDICAL EXAMINERS OF NORTH CAROLINA. From 1885 to 1890 inclusive.					Graduates Il- lenses,.....	Graduates re- jected.....	Non-graduates licensed.....	Non-graduates rejected.....
University of the City of New York, Medical Department .....	25	.....	1	2				
University of Pennsylvania.....	3	.....	2	.....				
University of Maryland.....	71	11	3	6				
University of Virginia.....	12	.....	4	2				
Vanderbilt University, Medical Department.....	4	8	.....	1				
University of South Carolina.....	.....	.....	.....	1				
University of Louisiana.....	2	.....	.....	.....				
University of Louisville.....	4	3	.....	.....				
University of Michigan.....	1	.....	.....	.....				
Medical College of Georgia.....	1	1	.....	.....				
Bellvue Hospital Medical College.....	17	3	1	3				
Atlanta Medical College.....	3	4	1	.....				
Medical College of Virginia.....	3	.....	2	1				
Medical College of the State of South Carolina.....	5	1	1	1				
Louisville Medical College.....	14	8	1	4				
Baltimore Medical College.....	3	4	1	.....				
College of Physicians and Surgeons, Baltimore.....	64	21	7	14				
College of Physicians and Surgeons, New York.....	3	.....	.....	1				
Kentucky School of Medicine.....	5	2	.....	.....				
Leonard School of Medicine.....	11	2	.....	3				
Jefferson Medical College.....	35	2	5	3				
Southern Medical College, Atlanta.....	2	2	.....	.....				
Long Island College Hospital.....	3	.....	.....	.....				
Woman's Medical College of Pennsylvania.....	1	.....	.....	.....				
Nashville Medical College.....	.....	.....	1	.....				
Baltimore University School of Medicine.....	1	1	.....	.....				
Medico-Chirurgical College, Philadelphia.....	1	2	.....	.....				
No College at all.....	.....	.....	.....	.....				
Western Reserve University, Cleveland, Ohio.....	1	.....	1	4				
Tulane University, Louisiana.....	1	.....	.....	.....				
Georgia College of Eclectic Medicine and Surgery, Atlanta.....	.....	1	.....	.....				
Howard University, Washington.....	.....	1	.....	.....				
New York Homeopathic Medical College.....	1	.....	.....	.....				
Totals.....	296	77	31	46				

NOTE:—The non-graduates, as a rule are men that have attended but one course,

# MEDICAL DEPARTMENT OF THE UNIVERSITY OF NORTH CAROLINA.

CHAPEL HILL, N. C.

ORGANIZED in 1796. Formerly granted diplomas. Does not now give medical instruction.

## EDINBOROUGH MEDICAL COLLEGE.

INCORPORATED, 1868. The college was located in the backwoods of Robeson county, near Lumberton, a small town of five hundred inhabitants. When the only professor (Dr. McLean) died a few years ago, the school became extinct. A number of its diplomas are found in North Carolina and other states.

## LEONARD MEDICAL SCHOOL.

(Medical Department of Shaw University.)

RALEIGH, N. C. JAMES MCKEE, M. D., Dean of the Faculty.

ORGANIZED in 1882, for the education of colored students of both sexes. The faculty consists of seven professors.

COURSE OF INSTRUCTION: The session of 1890-91, beginning November 1, 1890, continues five months. **Graded course of study extending over four years;** clinical instruction is made a prominent feature.

Order of studies: First year—**anatomy, physiology, general chemistry and materia medica;** second year—**practical anatomy, medical chemistry, physiology, pathological anatomy, practice of medicine and surgery;** third year—**therapeutics, obstetrics, theory and practice of medicine and surgery;** fourth year—**ophthalmology, otology, dermatology, syphilis, laryngology, diseases of the nervous system, diseases of women, diseases of children, operative surgery, forensic medicine.**

REQUIREMENTS: For admission—"Applicants must be at least eighteen years of age and will be required to pass a preliminary examination sufficient to show their fitness to enter upon the study of medicine, unless they can furnish a certificate of their previous standing in school from some principal or president of a reputable institution of learning." A literary course of two years' duration, preliminary to the medical course, has been established by the university.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **four years' graded course;** 4) dissection of the entire cadaver; 5) thesis; 6) satisfactory examination—an average of eighty per cent. being required to pass.

FEEs: Matriculation, \$5; lectures, \$60; graduation, \$10; incidentals, \$3.

STUDENTS: Number of matriculates and of graduates at each session reported and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	12	—	—
1884-85	17	—	—
1885-86	26	6	23+
1886-87	28	—	—
1887-88	31	5	16.1
1888-89	42	7	16.6
1889-90	53	6	11.3

Percentage of graduates to matriculates for the past seven years, 11.4.

## NORTH DAKOTA.

### AN ACT TO REGULATE THE PRACTICE OF MEDICINE IN THE STATE OF NORTH DAKOTA.

Approved January 10, 1890.

*Be it Enacted by the Legislative Assembly of the State of North Dakota:*

SECTION 1. The governor of the State shall appoint a Board of Examiners to be known as the State Board of Medical Examiners, consisting of nine members of whom eight shall be practicing physicians in good standing, who shall hold their office for three years after

such appointment and until their successors are appointed; provided that the members thereof first appointed under this act shall be divided into three classes, each class to consist of three. The first class shall hold office under such appointment for the period of one year; the second class for two years, and the third class for three years from the date of their respective appointment. It is further provided that no member thereof shall be appointed to serve for more than three terms in succession, and no member of any college or university having a medical department shall be appointed to serve as members of said board. Two members of said board shall be homœopathic physicians and one a lawyer.

Sec. 2. Said Board of medical examiners shall elect a president, secretary and treasurer and shall have a common seal. The president and secretary shall have the power to administer oaths. Said board of medical examiners shall hold meetings for examination at such places as the board may designate, on the first Tuesday of January, April, July and October of each year, and such other meetings as said board may from time to time appoint. Said board shall keep a record of all the proceedings thereof, and also a record or register of applicants for a license, together with his or her age, time spent in the study of medicine, and the name and location of all institutions granting to such applicant degrees or certificate of lectures in medicine or surgery. Such register shall also show whether such applicant was rejected or licensed under this act. Said books and register shall be *prima facie* evidence of all matters therein recorded.

Sec. 3. All persons hereafter commencing the practice of medicine, surgery and obstetrics in any of its branches in this State shall apply to said Board for a license so to do, and such applicant at the time and place designated by said Board, or at the regular meeting of said Board, shall submit to an examination in the following branches, to-wit: Anatomy, physiology, chemistry, histology, materia medica, therapeutics, preventive medicines, practice of medicine, surgery, obstetrics, diseases of women and children, diseases of the nervous system, diseases of the eye and ear, medical jurisprudence and such other branches as the Board shall deem advisable, and present evidence of having attended three courses of lectures of at least six months each; said Board shall cause such examination to be both practical and scientific, but of sufficient severity to test the candidate's fitness to practice medicine, surgery and obstetrics. When desired, said examination may be conducted in the presence of the dean of any medical school or the president of any medical society of the State. After examination, said Board shall grant a license to such applicant to practice medicine, surgery and obstetrics in the State of North Dakota, which said license can only be granted by the consent of not less than seven members of said Board, and which said license shall be signed by the president and secretary of said board and attested by the seal thereof. The fee of such examination shall be the sum of twenty dollars, and shall be paid by the applicant to the treasurer of said board, to be applied by the said board towards paying the expenses thereof. And such board may revoke or refuse a license for unprofessional, dishonorable or immoral conduct, for chronic or persistent inebriety, the practice of criminal abortion, or for publicly advertising special ability to treat or cure diseases which, in the opinion of said board, it is impossible to cure. In complaints for violating the provisions of this section, the accused person shall be furnished with a copy of the complaint and given a hearing before said board in person or by attorney. In all cases of refusal or revocation the applicant may appeal to the appointing power of said board.

Sec. 4. The person so receiving said license shall file the same or a certified copy thereof with the register of deeds where he or she resides, and said register of deeds shall file said certificate or copy thereof, and enter a memorandum thereof, giving date of said license and name of person to whom same was issued, and the date of such filing, in a book to be provided and kept for that purpose, and a list of all certificates on file in his office, and upon notice to him of the change of location or death of a person so licensed, or of the revocation of the license granted such person, said register of deeds shall enter at the appropriate places in the records so kept by him a memorandum of said fact; so that the record so kept by the said register of deeds shall correspond with the records of the said board as kept by the secretary thereof. In case a person so licensed shall move into another county of this state, he or she shall procure from the register of deeds a certified copy of said license, and file the same with the register of deeds in the county in which he or she shall remove. Said register of deeds shall file and enter the same with like effect as if the same was the original license.

Sec. 5. This act shall not apply to commissioned surgeons of the United States Army or Navy, to the physicians or surgeons in actual consultation from other states or territories, or to actual medical students practicing medicine under the direct supervision of a preceptor.

Sec. 6. Any person practicing medicine, surgery or obstetrics in this state without first having obtained the license herein provided for, or contrary to the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof in any court of competent jurisdiction, shall be fined not less than fifty nor more than two hundred dollars, or by imprisonment in the county jail not less than ten days nor more than sixty days, or both fine and imprisonment. Any person shall be regarded as practicing within the measures of this act who shall append the letters "M. D." or "M. B." to his or her name, or for a fee prescribe, direct or recommend for the use of any person, any drug or medicine, or other agency for the treatment, care or relief of any wound, fracture or bodily injury, infirmity or disease; provided, however, this act shall not apply to dentists. It shall be the duty of the respective state's attorneys to prosecute violations of this act.

Sec. 7. All acts and parts of acts heretofore passed inconsistent with the provisions of this act are hereby repealed.



## STATE BOARD OF MEDICAL EXAMINERS OF NORTH DAKOTA.

GRAND FORKS, N. Dak. J. R. LOGAN, M. D., Secretary.

The Board was organized July 31, 1890, at which time the rules and regulations of the State Board of Medical Examiners of Minnesota were adopted.

The first meeting for the examination of candidates was held on October 7, 8 and 9. One candidate was examined and passed. Two weeks later a supplementary examination was held to accommodate two other candidates, who also passed.

There are in North and South Dakota 726 practitioners exempt from examination by reason of registration under the old Territorial laws. The Secretary has in each county in North Dakota a correspondent who reports the location of any new man. In this way three glaring cases of quackery have been brought to light, and the offenders forced to leave the State.

## OHIO.

## MEDICAL COLLEGE OF OHIO.

(Medical Department of the University of Cincinnati.)

CINCINNATI, O. JAMES G. HYNDMAN, M. D., Secretary, 98 W. Ninth street.

ORGANIZED IN 1819. The first class was graduated in 1821. Classes have been graduated each subsequent year. In 1853 the Miami Medical College was merged into this institution, and continued in this relation until 1865, when the Miami was re-established. (See Miami Medical College, *infra*.) In 1887 it became the Medical Department of the University of Cincinnati.

The faculty consists of ten professors, ten assistants, three adjunct professors, two lecturers and four demonstrators.

COURSE OF INSTRUCTION: The collegiate year embraces a winter and a short spring course. The former, for the session of 1890-91, began September 24, 1890, and will close March 1, 1891. The spring course will begin about the middle of March and continue for six weeks. Clinics at hospital and dispensary, and private courses for advanced students and practitioners on special topics in medicine and surgery.

Lectures embrace ophthalmology, otology, anatomy, clinical surgery, materia medica, therapeutics, clinical medicine, theory and practice of medicine, principles and practice of surgery, obstetrics, diseases of children, gynecology, physiology, medical chemistry, bacteriology, clinical laryngology, pathology, dermatology, histology, hygiene, and medical jurisprudence. Daily examinations or quizzes are conducted by the assistants to the respective chairs. No fee is charged for this quiz, and all students are required to attend regularly.

REQUIREMENTS: For admission—"Applicants for admission to the college must bring certificates of good moral character, and must give evidence of at least a good English education, including mathematics and elementary principles of physics. An examination on these subjects, as taught in the common schools, will be conducted by a committee of the faculty. Graduates of a literary or scientific college, high school or academy, gentlemen having a county or State teacher's certificate, or graduates in medicine will be exempt from this examination.

"The general demand for a good preliminary education of those about to enter our profession is shown by the recent utterance of the American Medical Association and the enactments of several State boards of health. We desire to call special attention to the fact that in several States the diplomas of such schools as do not require an examination preliminary to entrance are not accepted as qualifying for practice."

For graduation: 1) satisfactory evidence of good moral character, and having attained the age of twenty-one years; 2) satisfactory certificate of having studied medicine for at least three years under a regular graduate, or licentiate and practitioner of medicine, in good standing, using the word "regular" in the sense commonly understood in the medical profession. "No candidate shall be eligible for final examination for graduation unless his term of three years' study shall have been completed, or shall expire at a date no later than three months after the close of the final examinations;" 3) at least two full courses of instruction; 4) dissections of at least two regions of the body; 5) clinical instruction (hospital) during each year's attendance; 6) must have attended at least one case of labor, under direction of Adjunct Professor of Obstetrics; 7) a satisfactory examination in each branch taught in the college.

**After the session of 1890-91 four years' professional study and three regular courses of lectures will be required as conditions of graduation.**

FEEs: Professors' tickets, \$75; matriculation ticket, \$5; dissecting ticket (including material), \$10; bacteriology, \$10; practical chemistry (including material), \$10; practical histology, (including material), \$10; practical pathology (including material), \$10; hospital ticket, \$5; spring term, \$10; graduation fee, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1879-80	326	103	31.6
1881-82	341	104	30.5
1882-83	302	102	33.7
1883-84	257	100	38.8
1884-85	209	58	27.7
1885-86	210	78	37.1
1886-87	213	71	33.3
1887-88	226	70	30.9
1888-89	243	86	35.3
1889-90	271*	91	33.5

Percentage of graduates to matriculates for ten years reported, 33.2.

#### WORTHINGTON MEDICAL COLLEGE.—(*Eclectic.*).

(*Medical Department of Ohio University.*)

WORTHINGTON, O.

ORGANIZED in 1832. Removed to Cincinnati in 1843. Classes were graduated in 1834, 1835, 1836, 1837 and 1838. Name changed to the Eclectic Medical Institute in 1845. (*Vide infra.*)

#### CINCINNATI MEDICAL COLLEGE.

CINCINNATI, O.

ORGANIZED in 1834. Merged into the Medical College of Ohio in 1846.

#### WILLOUGHBY UNIVERSITY, MEDICAL DEPARTMENT.

WILLOUGHBY, Lake County, O.

ORGANIZED in 1835. Removed to Columbus in 1846, where one course of lectures was given. Merged into Starling Medical College (*q. v.*) in 1847.

#### PHYSIO-MEDICAL COLLEGE.

(*Cincinnati Literary and Scientific Institute.*)

CINCINNATI, O.

ORGANIZED in 1836. Graduated classes until 1880.—Extinct.

#### BOTANICO-MEDICAL COLLEGE OF OHIO.

CINCINNATI, O.

CHARTERED in 1838.—Extinct in 1850.

#### AMERICAN MEDICAL COLLEGE.

(*Eclectic.*)

CINCINNATI, O.

ORGANIZED in 1839. Merged into the Eclectic Medical Institute in 1857.

---

\*Not including two graduates who matriculated.

## WESTERN RESERVE UNIVERSITY, MEDICAL DEPARTMENT.

(Cleveland Medical College, Medical Department of Adelbert College of the Western Reserve University.)

CLEVELAND, O. HUNTER H. POWELL, M. D., Registrar, 467 Prospect street.

ORGANIZED in 1843, as the Cleveland Medical College, Medical Department of Western Reserve College, by Profs. Ackley, Cassels and Delameter of the Willoughby University Medical Department; Prof. Kirtland of Cincinnati and Prof. St. John, chemist of Western Reserve College at Hudson. Re-organized in 1881 by a union of the faculty of the Cleveland Medical College and a majority of the faculty of the Medical Department of Wooster University, as the Medical Department of Western Reserve University. In March, 1882, the Board of Trustees of Western Reserve University conferred the *ad eundem* degree of Doctor of Medicine upon all graduates of the Cleveland Medical College, and upon such graduates of the Wooster Medical Department prior to 1881, as desired it.

The faculty consists of eighteen professors, one demonstrator, one assistant in pathology.

**COURSE OF INSTRUCTION:** The college year embraces a special spring and a regular winter course. The spring term of 1891 opens the first Wednesday in April and continues twelve weeks; the regular winter term opened September 17, 1890, and will close March, 4, 1891. The plan of instruction includes lectures, clinics, recitations, quizzes and practical demonstrations. **Three years' graded course required.** Great prominence is given to clinical teaching.

Lectures embrace: First year—The course will include descriptive anatomy with dissections; physiology, with exercises in the physiological laboratory; histology with examination of the minute structure of all the organs and tissues of the body; practical microscopy with instruction in the preparation, mounting and examination of objects; in organic chemistry with laboratory exercises and materia medica. Students will be examined at the close of the year in chemistry, osteology, histology, microscopy, elementary physiology and dissections.

Second year—During the second year instruction will be given in descriptive anatomy, surgical anatomy, physiology, materia medica and therapeutics, medical chemistry and toxicology, general pathology and morbid anatomy, principles and practice of medicine, principles and practice of surgery, hygiene, obstetrics and diseases of children. Examinations will be held at the end of the year in toxicology, anatomy, physiology, materia medica and therapeutics, obstetrics and diseases of children.

Third year—During this year the instruction is directed to the practical departments of general medicine and surgery and their specialties. The course includes the principles and practice of medicine and clinical medicine, obstetrics and diseases of children, principles and practice of surgery and clinical surgery, operative surgery and surgical pathology, gynecology, ophthalmology, otology, hygiene and medical jurisprudence.

Students are required to attend the general medical and surgical clinics at least during the second and third years and the clinics in special departments only during the last year.

**REQUIREMENTS:** For admission—1) credible certificates of good moral standing; 2) diploma of graduation from a literary and scientific college or high school or a teacher's certificate, or, lacking this, a thorough examination in the branches of a good English education; 3) at least eighteen years of age.

For graduation: 1) good English education; 2) twenty-one years of age; 3) three year's study; 4) **three full courses of lectures**; 5) dissection of the entire body; 6) examination satisfactory to the faculty and board of censors.

**FEES:** Matriculation and general ticket, \$75; summer session, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1879-80	86	27	31.4
1881-82	188	83	44.1
1882-83	161	50	31.
1883-84	167	54	32.3
1884-85	126	56	44.4
1885-86	119	47	39.4
1886-87	142	38	26.7
1887-88	134	45	33.5
1888-89	124	50	40.3
1889-90	124	45	36.2

Percentage of graduates to matriculates for ten years reported, 36.1.

## ECLECTIC MEDICAL INSTITUTE.

CINCINNATI, O. JOHN M. SCUDDER, M. D., 223 Court street.

ORGANIZED in 1845 as the successor of the Worthington Medical College (organized in 1832.) The American Medical College was merged into this school in 1857, and the Eclectic College of Medicine and Surgery in 1859. The first class was graduated in 1845 and classes have been graduated each subsequent year.

The faculty consists of eleven professors, one adjunct professor, one lecturer and a demonstrator.

**COURSE OF INSTRUCTION:** Two sessions annually. The regular session of 1890-91 commenced September 1, 1890, and continues twenty weeks; the spring session will commence January 12, and close June 2, 1891. **A three years' graded course is required.** Clinics at hospital and college. Women admitted upon the same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene and medical jurisprudence, pharmacy, clinical medicine and surgery, ophthalmology and otology, histology, microscopy, diseases of children and physical diagnosis.

**REQUIREMENTS:** For admission—1) credible certificate of good moral character; 2) diploma of graduation from a good literary and scientific college, or high school, or a first-grade teacher's certificate; lacking this, a thorough examination in the branches of a good English education, including mathematics, English composition and elementary physics or natural philosophy.

For graduation: **"Students applying for graduation must have read medicine for four years, and attended three sessions of lectures, of which only two can be consecutive; or, preferably, three sessions of six months each in different college years; or, he must have attended four sessions of six months each without previous reading; must take the special laboratory courses, attend the hospital two sessions, and make three dissections."** Examinations for the degree of doctor of medicine will be held at the close of both winter and spring sessions, but there will be but one public commencement yearly—at the close of the spring session, and all diplomas will bear date of the first Tuesday in June.

**FEES:** Laboratory courses \$5 each; lectures, including matriculation, tuition, and demonstrator's ticket, \$75; scholarships, \$200.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	316	114	36+
1881-82	272	100	36.7
1882-83	225	64	28.4
1883-84	190	83	43.6
1884-85	169	69	40.8
1885-86	161	58	36+
1886-87	170	63	37+
1887-88	187	61	32.6
1888-89	202	69	34.1
1889-90	184	69	37.5

Percentage of graduates to matriculates for past ten years, 36.1.

## STARLING MEDICAL COLLEGE.

COLUMBUS, O. T. C. HOOVER, M. D., Registrar, 249 East State street.

ORGANIZED in 1847. The Medical Department of Willoughby University was merged into it the same year. The first class was graduated in 1848. Classes have been graduated each subsequent year.

The faculty consists of nine professors, four lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** The regular session of 1890-91 began September 10, 1890, and closes March 6, 1891.

**A three years' course of lectures and four years' study will be obligatory after the session of 1890-91.**

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, medical jurisprudence, diseases of children, venereal diseases, ophthalmology and otology, toxicology, histology and hygiene.

**REQUIREMENTS:** For admission: "Applicants for admission into the college must give satisfactory evidence of having, at least, a fair English education."

For graduation: 1) twenty-one years of age, and certificate of good moral character; 2) three years' study; 3) two full courses of medical lectures; 4) successful examination; 5) thesis; 6) one course of dissection; 7) satisfactory examinations.

**FEES:** Matriculation, \$5; demonstrator, \$50; lectures, \$50; laboratory, chemical and histological, each \$5; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	99	35	35.3
1881-82	116	52	44.8
1882-83	59	24	40.6
1883-84	71	25	35.4
1884-85	85	30	35.2
1885-86	78	28	35.9
1886-87	89	20	22.4
1887-88	89	37	41.5
1888-89	103	28	27.1
1889-90	124	39	31.4

Percentage of graduates to matriculates for past ten years, 34.8.

### HOMEOPATHIC HOSPITAL COLLEGE.

CLEVELAND, O. W. A. PHILLIPS, M. D., Registrar, 29 Euclid avenue.

ORGANIZED in 1849, as the Western College of Homeopathic Medicine. In 1857 the name was changed to the Western Homeopathic College, and in 1870 the corporation assumed the present title. In 1870 the Homeopathic College for Women was merged into this institution. The first class was graduated in 1853. Classes have been graduated in each subsequent year.

Faculty consists of eleven professors, seven lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** The regular annual term of 1890-91 began September 24, 1890, and closes March 25, 1891. **A three years' graded course is required.** Previous to each lecture the class will be questioned upon the subjects of the preceding lecture. Women admitted upon same terms as men.

Lectures embrace anatomy, physiology, chemistry, urinary analysis, toxicology, materia medica, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, medical jurisprudence, hygiene and sanitary science, ophthalmology and otology, microscopy and histology, nervous and mental diseases, diseases of nose and throat, diseases of the genito-urinary organs, dermatology, pædology and physical diagnosis.

**REQUIREMENTS:** For admission, "All applicants must present a degree in letters or science, a diploma from a high school or academy, or a teacher's certificate, or pass a creditable examination in orthography, penmanship, composition, arithmetic, English grammar and United States history."

For graduation: 1) twenty-one years of age; 2) **three full courses of lectures**; 3) three years' study; 4) good English education; 5) well sustained written examinations; 6) good moral character.

**FEES:** Matriculation, (paid once only), \$5; lectures, \$65; demonstrator, \$5; hospital, \$5; graduation, \$30; chemistry and histology, each \$5.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	131	26	19.8
1881-82	129	26	20.1
1882-83	131	55	50.9
1883-84	91	40	43.9
1884-85	84	30	35.7
1885-86	82	26	31.7
1886-87	83	20	24+
1887-88	92	34	36.9
1888-89	101	24	23.7
1889-90	102*	35	34.3

Percentage of graduates to matriculates for past ten years, 30.7.

**For requirements of the American Institute of Homeopathy as to admission and graduation in 1892, see Introductory Remarks.**

---

\*Not including one graduate who matriculated.

## CINCINNATI COLLEGE OF MEDICINE AND SURGERY.\*

CINCINNATI, O. WILLIAM R. AMICK, M. D., Secretary, 164 George street.

ORGANIZED in 1849. First class was graduated in 1852, and one or more classes have been graduated each subsequent year.

The faculty consists of eleven professors, seven special and adjunct professors and demonstrators.

COURSE OF INSTRUCTION: The regular graduating session of 1890-91, began October 1, 1890, and closes the first of March, 1891. Students may, if they desire, have their course of instruction graded.

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, ophthalmology and otology, laryngology, oral surgery, diseases of children, orthopaedic surgery, genito-urinary diseases, histology and microscopy, pharmacy, diseases of the nervous system and dermatology.

REQUIREMENTS: For admission—"Students applying for admission must present satisfactory evidences, by examination, diploma or teacher's certificate, of an adequate English education. Students having attended one or more courses of lectures in some other regular medical college, will be admitted on presentation of tickets to this effect."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) three years' study; 5) satisfactory examination; 6) practical anatomy at least one course; 7) hospital clinics for one session.

**After the session of 1890-91, four years of study including three courses of lectures will be necessary for graduation.**

FEES: Matriculation, \$5; demonstrator, (including material), \$10; hospital, \$5; chemical laboratory, \$5; lectures, \$40; graduation, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	93	30	32.2
1881-82	35	15	42.8
1882-83	46	15	34.7
1883-84	—	14	—
1884-85	53	25	47.1
1885-86	36	17	47.2
1886-87	42	15	35.7
1887-88	49	15	30.6
1888-89	72	32	44.4
1889-90	48	27	56.2

Percentage of graduates to matriculates for nine years reported in full, 40.2.

## MIAMI MEDICAL COLLEGE.

(Medical Department of the University of Cincinnati.)

CINCINNATI, O. WM. H. TAYLOR, M. D., Dean, 329 West Seventh street.

ORGANIZED in 1852. Classes were graduated from 1853 to 1857, inclusive. In 1858 this college was merged into the Medical College of Ohio—which see, (*ante*). In 1865 the Miami Medical College was re-established and a class was graduated in 1866, since which time classes have been graduated annually.

The faculty consists of eleven professors, six demonstrators and one assistant demonstrator.

COURSE OF INSTRUCTION: The winter session of 1890-91 began October 1, 1890, and continues for six months. A three-years' graded course recommended but not required—see "Remarks" appended. Special hours are devoted by each professor to review examinations of his preceding lectures. Clinics at dispensary and hospital. The College building has been recently remodeled.

Lectures embrace clinical medicine, principles and practice of surgery, ophthalmology, aural surgery and obstetrics and clinical midwifery, principles and practice of medicine, materia medica and therapeutics, diseases of women and children and clinical gynecology, chemistry and toxicology, clinical surgery, physiology, clinical laryngology, hygiene, descriptive and surgical anatomy, pathology, medical jurisprudence, histology, paediatrics, biology and botany.

\* The Woman's Medical College of Cincinnati is organized as a department of this college, although possessing a distinct faculty and equipments.

**REQUIREMENTS:** For admission—"The student must give evidence of educational qualification in the form of a diploma from a college or high school, or a teacher's certificate. In the absence of any of these he must submit to an examination by a committee of the faculty."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of lectures; 5) one course of practical anatomy; 6) of practical chemistry; 7) clinics at the hospital; 8) full and satisfactory examination on each branch taught in the college.

**Remarks:** After the session of 1890-91, the student will be required to furnish evidence that he has studied medicine four years and attended three courses of lectures before he will be permitted to come up for graduation.

**FEES:** Matriculation, \$5; demonstrator, including material \$10; practical chemistry, practical physiology, histology and pathology, \$10 each course; lectures, first and third years each, \$37.50, second year, \$75; graduation, \$25; hospital, \$5; single tickets, \$10 each branch; operative surgery, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	126	34	26.1
1881-82	124	41	33+
1882-83	114	41	35.4
1883-84	104	28	26.9
1884-85	104	27	25.9
1885-86	100	37	37.
1886-87	99	29	29.2
1887-88	83	21	25.3
1888-89	91	20	21.9
1889-90	96	31	32.2

Percentage of graduates to matriculates for past ten years, 29.6.

## ECLECTIC COLLEGE OF MEDICINE AND SURGERY.

CINCINNATI, O.

**ORGANIZED** in 1856. Classes were graduated in 1857, 1858 and 1859.—Merged into the Eclectic Medical Institute in 1859.

## PHYSIO-MEDICAL INSTITUTE.

CINCINNATI, O.

**ORGANIZED** in 1859.—Extinct, 1885.

## MEDICAL DEPARTMENT OF THE UNIVERSITY OF WOOSTER.

CLEVELAND, O. F. E. BUNTS, M. D., Secretary, 380 Pearl street.

**ORGANIZED** in 1863, as the Charity Hospital Medical College. It was transferred to its present connection in 1870. The first class was graduated in 1865. One or more classes have been graduated in each subsequent year, excepting 1881.

Faculty consists of sixteen professors, six assistants to chairs and one lecturer.

**COURSE OF INSTRUCTION:** The faculty have changed their calendar to the "one session a year" plan. The summer, or graduating session will commence March 5, 1891, and continue twenty-one weeks. Women admitted on the same terms as men. **A three years' graded course is obligatory on all matriculates. Beginning with the session of 1891, four years of study will be required.**

Lectures embrace anatomy, physiology and histology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, dermatology, diseases of children, ophthalmology and otology, laryngology, pathology and microscopy, ethics, diseases of the nervous system.

**REQUIREMENTS:** For admission—Applicants for admission to this school are required to give evidence of possessing a good English education, and a certificate of good moral character.

"An examining committee has been appointed in order to comply with the requirements of the laws of the various states, and state boards of health, demanding a preliminary examination before admission to medical lectures. Students possessing academical degrees, or who have graduated at high schools, or who have received a teacher's certificate, will do well to bring evidence of that fact with them."

For graduation: 1) twenty-one years of age; 2) three years' study; 3) complete dissection of the human body; 4) **three full courses of lectures**; 5) satisfactory written examination on all branches taught; 6) a good education; 7) a good moral character. No honorary degrees in medicine are granted. Irregularity of conduct, negligence and frequent absence from lectures will always be regarded as obstacles to the attainment of a degree.

**FEES:** Matriculation, \$5; general ticket, for graded course, \$60; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	106	37	34.9
1882	33	14	42.4
1883	57	17	21+
1884	46	16	34.7
1885	37	23	62.1
1886	43	17	39.5
1887	38	19	50
1888	50	22	44
1889	54	21	38.8
1890	64	22	34.3

Percentage of graduates to matriculates for past ten years, 39.3.

## PULTE MEDICAL COLLEGE.

(*Homeopathic.*)

CINCINNATI, O. CHAS. E. WALTON, M. D., Registrar, Seventh and John streets.

**ORGANIZED** in 1872. The first class was graduated in 1873. Classes have been graduated each subsequent year.

Faculty consists of fifteen professors, three lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** The session of 1890-91 began September 17, 1890, and closes March 10, 1891. Clinics at hospital and dispensary: quizzes by professors and students' society.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, histology, microscopy, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, ophthalmology and otology, diseases of the nervous system, pedology, medical jurisprudence, pharmacology, toxicology, hygiene and sanitary science, genito-urinary and rectal diseases, the "Organon."

**REQUIREMENTS:** For admission—"An entrance examination will be held preliminary to matriculation, covering the common English branches. Any student presenting a college or high school diploma, or a certificate of admission to any literary college, or a teacher's certificate will be exempt from this examination."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three full courses of lectures of at least six months each**; 4) three years' study; 5) thorough examination on all subjects taught in the school; 6) dissection of at least two parts; 7) attendance on daily clinical lectures at hospital.

**FEES:** Matriculation, (paid but once) \$5; lectures, \$50; hospital, \$5; demonstrator, each term, \$5; graduation, \$30; single tickets, each chair, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	88	41	46.6
1881-82	79	34	43+
1882-83	66	31	47
1883-84	66	16	24.6
1884-85	52	30	57.7
1885-86	55	16	29+
1886-87	71	19	26.7
1887-88	61	30	49.1
1888-89	67	24	35.8
1889-90	61	16	26.2

Percentage of graduates to matriculates for past ten years 38.6.



## AMERICAN HEALTH COLLEGE.

CINCINNATI, O.

ORGANIZED in 1874-'6. The faculty is one person who teaches "the great Vitapathic system, which he originated and copyrighted." The possessor of one of these diplomas was arrested in Illinois for practicing without the certificate prescribed by law—the STATE BOARD OF HEALTH having refused to issue such certificate on the diploma. On trial the man was found guilty and left the State. Ten so-called doctors are practicing in New Jersey with no other credentials than the diplomas of this concern. This is also the case in other states where diplomas of legally chartered institutions are the only qualification necessary to practice medicine. In short, laws of this character stimulate the sale of diplomas and are incentives to the organization of bogus medical colleges.

The following is taken from the Cincinnati Post, Nov. 24, 1890:

"A meeting that leaves spiritualistic seances far in the gloom, took place recently, at the American Health College, North Fairmount. It was the religious ceremony following the close of the fall term of the Health College. The auditorium was filled with enthusiastic men and women. After music and song, Dr. Campbell explained the all-pervading great spirit, as taught in the vitapathic system, and especially the silent breathing prayer. All present there, stood up and breathed the prayer, taking in great quantities of the ever present Vita. The professor next explained the milk sacrament, which was used instead of wine. This was for the new graduates only. The ceremony grew more select all the while, and the last degree was the Holy Ghost baptism, a ministerial ordination for the select few. Some 20 old graduates formed a mystic ring around the new candidate, and the professor placed his hands upon his head and pronounced the magic words that made the brother a minister of life in vitapathy 'by authority of law and religion, according to chartered rights of the vitapathic system.' It is solemnly asserted that 'during the whole meeting a wonderful power was felt by all, and throngs of angels were seen by clairvoyant eyes.' Then, amid intense good feeling, some presents were given Dr. Campbell, and they all felt that the millennium was just due. But the great outside world is still in the darkness of the nineteenth century.

"The class that graduated from the college this fall was composed of the following persons:

"T. J. Dunbar, Ironton, O.; J. W. DeHoog, Covington, Ky.; Miss Emma Hicks, Monticello, Ky.; Miss Lucy Hawkins, St. Louis, Mo.; Mrs. Ellen H. Hatch, Elkhart, Ind.; Mrs. J. Cummings, of Georgia; G. O. Perry and C. B. Burnish, of Pennsylvania; Joe. Lee, of Nebraska; J. H. Thurman, Texas.

"All are now practicing physicians in the vitapathic system.

"There are several of former classes practicing in this city—Geo. B. Kolb, on Ninth st.; James Layman and wife, on Pearl street, A. Grandjian and wife at 203 Western av.; Mrs. Mary Rinehart, 45 Wesley av.; Henry C. Wendell, 131 Brown st., and Minnie E. Jennings, 527 W. Sixth st."

## COLUMBUS MEDICAL COLLEGE.

COLUMBUS, O. J. M. DUNHAM, A. M., M. D., Secretary, 222 East Town street.

ORGANIZED in 1875. The first class was graduated in 1876. Classes have been graduated each subsequent year.

Faculty consists of twelve professors, one adjunct professor, one demonstrator, two lecturers and two assistants.

COURSE OF INSTRUCTION: The sixteenth annual course of lectures commenced September 3, 1890, and will close March 5, 1891. This will be followed by a recitation course of twelve weeks. Instruction consists of didactic and clinical lectures, with daily quizzes. Three years' graded course recommended but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology, otology, histology, diseases of children, toxicology, dental surgery, dermatology and microscopy, physical diagnosis, laryngology and electro-therapeutics.

REQUIREMENTS: For admission—"A fair English education, as shown by certificates for teaching, graduation from high schools, or other evidence satisfactory to the faculty."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) not less than two courses of lectures; 4) three years' study; 5) complete dissection of the human body; 6) satisfactory examination; 7) one course of clinical lectures at hospital; 8) thesis; 9) laboratory courses in chemistry and pathology.

Beginning with the term of 1892-93 this College will require that all candidates for graduation shall have attended three full courses of lectures, and have studied medicine four years.

FEES: Matriculation (each term), \$5; lectures, first course, \$40; second course, \$40; third course, \$20; spring course, \$10; demonstrator, \$5; demonstrator of chemistry, \$5; graduation, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	142	61	42+
1881-82	131	59	45+
1882-83	123	46	37+
1883-84	77	30	38.9
1884-85	51	18	35.2
1885-86	51	19	37.2
1886-87	57	18	31.5
1887-88	54	15	27.7
1888-89	73	22	30.1
1889-90	71	30	42.2

Percentage of graduates to matriculates for past ten years, 38.3.

### PHYSIO-ECLECTIC MEDICAL COLLEGE.

CINCINNATI, O.

ORGANIZED in 1876.—Extinct. A fraudulent institution, engaged in the sale of diplomas. In 1879 the name was changed to the American Eclectic Medical College, and a new charter was obtained, but the same practices were continued under the new title.

### ZANESVILLE ACADEMY OF MEDICINE.

ZANESVILLE, O.

ORGANIZED in 1877. Under the laws of Ohio the Academy had authority to examine candidates who wished to practice medicine, and if found qualified issue certificates to that effect. This right was exercised in six or seven instances after a written and oral examination. Owing to internal dissension the Academy was closed by order of court in 1881.

### TOLEDO SCHOOL OF MEDICINE.

TOLEDO, O.

ORGANIZED in 1878, as a school of instruction only, and did not confer degrees. It held three sessions and was then suspended. See *Northwestern Ohio Medical College*.

### AMERICAN ECLECTIC MEDICAL COLLEGE.

CINCINNATI, O. A. C. WRIGHT, M. D., Registrar, P. O. Box 413.

ORGANIZED in 1883.

Faculty consists of eleven professors and two lecturers.

COURSE OF INSTRUCTION: The fifteenth annual course of lectures began September 2, 1890, and will continue until January 24, 1891. One term of twenty weeks. Students entering will be permitted to adopt the *graded* or the *full lecture* course, as time or choice may determine in individual cases. There is a spring session of twenty weeks, commencing January 21, 1891, and closing June 10. Women admitted upon same terms as men.

Lectures embrace anatomy, physiology, pathology, histology and microscopy, materia medica, principles and practice of medicine, surgery, obstetrics, gynecology, chemistry, toxicology, therapeutics, clinical medicine, electro-therapeutics, dermatology, ophthalmology and otology, sanitary science and medical jurisprudence, diseases of children and mental science.

REQUIREMENTS: For admission—"Applicant must bring acceptable testimonials as to moral character and of the time spent in medical studies. They must give evidence of attainments equal to a good common school education."

For graduation: 1) the applicant must have attained the age of twenty-one years by the time of graduation; 2) a final and satisfactory examination must be passed on all the branches of the lecture course at this college; 3) **four years' study of medicine**; 4) two full courses of dissection under a demonstrator must have been attended, also clinical hospital instruction during each year of college study **and three full courses of lectures, not consecutive**; 5) the certificates of good moral character, and of the

time spent in previous medical studies, required and received at registration, will be satisfactory for graduation, in the absence of any impairment of standing; it being always understood that the graduating session has been in this college, with at least five months of vacation preceding it, or with a lecture course intervening.

**FEES:** Matriculation, \$5; lectures, each session, \$60; Cincinnati Hospital fee, \$5; perpetual scholarship, \$150; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883-84	13	6	46+
1884-85	24	9	37.5
1885-86	28	11	39.2
1886-87	21	7	33.3
1887-88	40	15	37.5
1888-89	43	10	23.2
1889-90	71	22	30.9

Percentage of graduates to matriculates for past seven years, 33.3?

### Diplomas not recognized.

**NOTE:**—Of the 11 professors of this college 8 are graduates of the college since January, 1887. One is a graduate of the class of 1887, three of 1888 (one, the Dean, with honorary and one with *ad eundem* degree), two of 1889, and two of 1890. The Dean is in the Medical Directory as living in Cincinnati and in Newfield N. J. It is stated in the announcement that graduates of the college are practicing in "Great Britain and the Colonies. Students out of the States will do well to write to the following gentlemen (*foreign correspondents*) who are authorized to give all information as to requirements, fees or scholarships necessary to a course of study and graduation at this school: R. F. Richardson, M. D., 15 Drury Hill, Nottingham, England; John Simmons, M. D., 34 Manchester Road, Hyde, England; Chas. J. Fowler, M. D., 173 High street, West Norwood, London." R. F. Richardson is in the list of graduates of 1887, but was not matriculated in 1885-86. His matriculation address is given as "England." \* Among other graduates of this college are the following who were prominently connected with the recently exposed Union Medical Institute, Newbury, Vermont: Watson S. Cowan, 1889, Augustus C. Fowler (*ad eundem*) 1889, George B. Hatch, 1889, J. B. Kepler Evans or Evins, 1889, and Basil Henderson, 1890. See *Union Medical Institute*, under Vermont.

## TOLEDO MEDICAL COLLEGE.

TOLEDO, O. JONATHAN PRIEST, M. D., Secretary, 902 Adams street.

**ORGANIZED IN 1883.** The first class was graduated in 1883.

Faculty consists of twelve professors, two lecturers, one instructor and one demonstrator.

**COURSE OF INSTRUCTION:** The regular session of 1890-91 began September 17, 1890, and closes March 18, 1891. **A three-years' graded course required.** Women admitted on same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, physical diagnosis, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology and otology, toxicology, diseases of children, histology and pathology, diseases of the nervous system, microscopy and orthopedic surgery.

**REQUIREMENTS:** For admission—"Students before being admitted to the class, must present a diploma from some literary and scientific college or high school, or a teacher's certificate, or in lieu thereof pass an examination before the examining committee of the faculty, on the branches of a good English education, including mathematics, English composition and natural philosophy."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **four years' study;** 4) **three full courses of lectures;** 5) two courses of dissections; 6) satisfactory examination in all the branches taught; 7) one course of practical chemistry and urinalysis, one course in the physiological laboratory, two courses of hospital practice and college clinics.

**FEES:** Matriculation, 5; lectures, \$40; demonstrator, including material, each course \$10; chemical or physiological laboratory, each \$5; hospital ticket, \$5; graduation, \$25.

---

\* What is the legitimate function of the foreign correspondents of a medical college? Of the 22 graduates of this college in the session of 1889-90, but 6 were matriculates in 1888-89.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1883	19	7	36.8
1883-84	33	14	42.4
1884-85	38	13	34.2
1885-86	33	10	30.3
1886-87	40	11	27.5
1887-88	29	6	20.6
1888-89	28	8	28.5
1889-90	36	3	8.3

Percentage of graduates to matriculates for past eight years, 28.1.

### NORTHWESTERN OHIO MEDICAL COLLEGE.

TOLEDO, O. C. A. KIRKLEY, M. D., Secretary, Jefferson and Eleventh streets.

**ORGANIZED** in 1883. This college is an outgrowth of the Toledo School of Medicine, which see, *ante*.

Faculty consists of fifteen professors, three lecturers and three demonstrators.

**COURSE OF INSTRUCTION:** The session of 1890-91 began September 17, 1890, and will continue six months. Didactic lectures, clinical instruction in hospital and dispensary. A three years' graded course recommended, but not required.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, toxicology, histology, hygiene and state medicine, medical jurisprudence, ophthalmology and otology, diseases of children, diseases of the mind and nervous system, orthopedic surgery, diseases of the throat and nose, physical diagnosis, dermatology, electro-therapeutics and dentistry.

**REQUIREMENTS:** For admission: "Students desiring to attend the lectures of this college must furnish: 1) satisfactory certificates of good moral character; 2) diploma of graduation from a literary or scientific college or high school, or, in absence of this, 3) must pass a satisfactory examination in the branches necessary to a good English education, including mathematics, English composition and elementary physics or natural philosophy."

For graduation: 1) good moral character; 2) three years' study; 3) twenty-one years of age; 4) two full courses of dissection; 5) two full courses of lectures; 6) attendance during at least two terms of chemical and hospital instruction; 7) must pass a satisfactory examination on all branches; 8) regular attendance during the entire lecture courses, allowance being made only for absence occasioned by the student's sickness, such absences not to exceed twenty per cent. of the course; 9) attendance upon regular examination, or quizzes made by each professor, daily or at least each week; 10) thesis.

**Beginning with the session of 1891-92 four years' study under the direction of a regular practitioner, and attendance upon three full courses of lectures will be required.**

**FEES:** Matriculation, \$5; demonstrator, \$5; laboratory course in physiology, chemistry and histology, each \$5; lectures, \$40; final examination fee, \$15; graduation, \$10 returnable.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates	Percent.
1883-84	11	1	9+
1884-85	14	4	28.5
1885-86	23	2	8.7
1886-87	23	5	21.7
1887-88	19	9	47.3
1888-89	18	2	21.2
1889-90	17	5	29.4

Percentage of graduates to matriculates for past seven years, 22.4.

### WOMEN'S MEDICAL COLLEGE OF CINCINNATI.

CINCINNATI, O. D. D. BRAMBLE, M. D., Dean, 165 Broadway.

**ORGANIZED** in 1887 as a department of the Cincinnati College of Medicine and Surgery, and, although possessing a distinct Faculty and equipments, is conducted under the authority of the Board of Trustees of that institution. First class graduated in 1888.

The faculty consists of ten professors, one demonstrator and three lecturers.

**A three years' graded course is required.**

**COURSE OF INSTRUCTION:** The fifth annual session began September 2, 1890, and will terminate about the middle of March, 1891.

**Lectures embrace:** First year—lectures and recitations on anatomy, physiology, chemistry and materia medica. Second year.—All the lectures and recitations of year before, and in addition, attendance upon the lectures on pathology, therapeutics, practice of medicine, surgery, obstetrics, diseases of women, diseases of children, laryngology, college and hospital clinics. At the end of the second year the student may take final examinations in anatomy, physiology, chemistry, materia medica and therapeutics. A student who fails to pass a primary branch at the end of the second year will be required to attend another full course upon this branch and pass satisfactory final examinations. Third year.—Lectures and recitations on all the branches of second year, and practical exercises connected with these, except where final examination has been passed; also ophthalmology and otology, college and hospital. Final examinations on all subjects not passed at end of second year. Clinics at college and hospitals.

"Recognizing the fact that the study of diseases of women and children and obstetrics is the special aim of female students, particular attention will be paid to a thorough instruction, both clinical and didactic, in these branches. Arrangements are being made by which advanced students, and those taking a special course in midwifery, will have the privilege of attending one or more cases of labor during the term."

**REQUIREMENTS:** For admission—"Students applying for admission must present satisfactory evidence, either by examination, or diploma, or teacher's certificate, of an adequate English education." Certificates of character must be presented at time of matriculation.

For graduation: 1) good moral character; 2) twenty-one years of age; 3) **have studied medicine for four years;** 4) **attended three regular courses of lectures,** the last of which must have been in this college; 5) must have been adequately engaged in the study of practical anatomy; 6) satisfactory final examinations (a system of grade quizzes will be established during the term in all departments as an adjunct to the formal final examinations.)

**FEES:** Matriculation, \$5; lectures, \$40; demonstrator, including material, \$10; laboratory, \$5; hospital, \$5; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1887	14	—	—
1888	18	1	5.5
1889	28	6	21.4
1890	22	6	27.2

Percentage of graduates to matriculates for past three years, 19.1.

## NATIONAL NORMAL UNIVERSITY, COLLEGE OF MEDICINE.

LEBANON, Ohio. B. F. MAXWELL, M. D., Dean.

The faculty consists of nine professors and two adjunct professors. "The mode of teaching is by lectures, recitations and quizzes. Females admitted upon the same terms as males."

**COURSE OF INSTRUCTION:** The school year is thirty weeks—a graded course is provided for students wishing to complete the scientific course in the University.

Lectures embrace principles and practice of surgery, diseases of the nervous system, obstetrics and diseases of women and children, ophthalmology, otology, laryngology, chemistry and physics, materia medica, therapeutics, toxicology, general, descriptive and surgical anatomy, medical chemistry, hygiene, principles and practice of medicine, physiology and medical jurisprudence. Clinics at hospital and college.

**REQUIREMENTS:** For admission: "The matriculant must be a graduate of the literary department of the National Normal University, or of some other reputable institution of learning; or the holder of a teacher's certificate. In the absence of such testimony he must furnish satisfactory evidence of having received a good English education."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) three full courses of medical instruction; 5) "furnish evidence of having previously read medicine under a competent instructor for at least one year, or received medical instruction fully equivalent to such reading in this or some other approved institution."

**FEES:** Matriculation, each year, \$5; general ticket (20 weeks) \$20, (30 weeks) \$30; dissecting ticket, \$5; hospital ticket, \$5; medical chemistry, \$5; laboratory ticket, \$5; graduation fee, \$10.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1888	19	0	—
1889	22	5	22.7
1890	22	6	27.2

Percentage of graduates to matriculates for past two years, 25.

## INTER-NATIONAL ELECTROPATHIC INSTITUTION.

MENTOR, Ohio. J. W. LOWE, M. D., M. E., Principal, P. O. Box 132.

CHARTERED under the laws of Pennsylvania, 1861. Established in Brantford, Ontario, 1876, in Mentor, Ohio, 1889.

Persons holding certificates from this institution have claimed recognition, and for this reason attention is called to it.

**Certificates not recognized.**

## MEDICAL UNIVERSITY OF OHIO?

CINCINNATI, O. M. J. VAN VLECK, M. D., Dean, 417 West Liberty street.

ORGANIZED in 1883. See this REPORT, 1890. **Diplomas not recognized.**

## OHIO COLLEGE OF OBSTETRICS, MEDICINE AND MIDWIFERY?

(Formerly of Indianapolis, Indiana.)

Now located in Cincinnati, Ohio.

CHARTERED under the laws of the State of Ohio, 1889. See this REPORT, 1890. **Diplomas not recognized.**

## CLEVELAND MEDICAL COLLEGE.

(Homeopathic.)

CLEVELAND, Ohio. CHARLES C. TRUE, M. D., Registrar, 106 Euclid avenue.

ORGANIZED in 1890.

Faculty consists of eleven professors, nine lecturers, one demonstrator, one assistant demonstrator and one assistant to chair of gynecology.

**COURSE OF INSTRUCTION:** The first regular annual session commenced September 24, 1890, and will end March 25, 1891. **A three-years' graded course will be strictly adhered to by this institution.** Previous to each lecture the class will be questioned upon the subject of the preceding lecture. Clinics at hospital and dispensary.

Lectures embrace: First year—*anatomy, osteology, physiology, chemistry, histology, microscopy, general pathology, hygiene and sanitary science, jurisprudence and principles of Homeopathy, including a study of the "Organon."* Second year—*anatomy, surgical anatomy, diseases of the nervous system, physiology, chemistry, jurisprudence, theory and practice of medicine, principles of surgery and surgical pathology, obstetrics, ophthalmology, otology and gynecology.* Third year—*theory and practice of medicine, including special pathology, physical and differential diagnosis, materia medica, surgery, obstetrics, ophthalmology, otology and gynecology.*

**REQUIREMENTS:** For admission—"All applicants for matriculation will be required to present evidence of at least a fair English education, by exhibiting a diploma from some college, academy or high school, or a teacher's certificate. Those who have no such diploma or certificate will be required to pass an examination in the common English branches, viz: English grammar, arithmetic, spelling, English composition and the more familiar portions of United States History."

For graduation: 1) good moral character; 2) twenty-one years of age; 3) three-years' study; 4) **three annual courses of lectures**; 5) a satisfactory written examination in all branches taught in the college.

**FEES:** Matriculation (once only), \$5; lectures, \$40; chemical, histological and hospital fees (once only), each \$5; anatomical ticket, \$5; graduation, \$30.

**OREGON.****OREGON STATE BOARD OF MEDICAL EXAMINERS.**

PORTLAND, Oregon. JAMES BROWNE, M. D., Secretary, 308 First street.

ORGANIZED May 28th, 1889. Consists of three members appointed by the governor of the state for terms of three years each.

The duties of the Board and the power and authority vested in it by the legislature, as declared in the "Act to regulate the practice of medicine and surgery in the State of Oregon," are the following:

1st. To examine and verify the diplomas of applicants for license to practice medicine and surgery in the state of Oregon, and to issue such license.

2nd. To determine the standing of medical institutions.

3rd. To examine non-graduates in the various branches of a medical education, and to issue license to such as pass a satisfactory examination.

4th. To revoke licenses when licentiates are guilty of unprofessional conduct.

From the 28th of May, 1889 (date of organization), to November 11, 1890, the Board examined and verified the diplomas of 213 persons—graduates of legally chartered medical schools, in good standing—and issued licenses thereon; also the diplomas of 11 persons—graduates of medical schools which graduate more than forty per cent. of their students; and these persons, having supplemented their diplomas by a satisfactory examination before the Board, were granted licenses. The Board examined 21 non-graduates, granting license to 6 whose examination was satisfactory, and rejected 15 who failed to answer seventy-five per cent. of the questions asked; refused license to an applicant who presented two diplomas, one purporting to have been issued by "The College of Physicians of Tennessee," and the other by the "Academy of Medicine," of old Mexico, both being fraudulent. The Board has a number of applications pending before it.

Non-graduates, applying for license, are examined in the following branches: Anatomy, physiology, pathology, materia medica, chemistry, surgery, midwifery, gynecology, hygiene, practice of medicine, medical jurisprudence.

Applicants must answer 75 per cent. of the questions asked.

This Board, at their meeting on the 15th of July, 1889, adopted the following rules, defining what, in the judgment of the Board, constitutes unprofessional conduct:

1st. Claiming to cure for advance compensation, diseases that are ordinarily considered to be incurable.

2d. Claiming to possess unusual skill, experience or facilities in the treatment of disease, setting forth this claim by means of advertising in the public press, or by circulating hand bills, pamphlets or cards inviting the attention of persons affected with certain maladies, and promising them radical cures.

3d. Publishing cases, operations, cures or remedies in the public prints, or adducing certificates of skill, success, or performing any other similar acts.

4th. Immoral conduct, such as felony, perjury, or drunkenness whilst attending a patient seriously ill.

5th. Committing or attempting to commit a criminal abortion, or aiding and abetting the same.

6th. Practicing under an assumed name, personating another of like name or of different name, buying or selling or fraudulently obtaining a degree, diploma, certificate or license.

7th. Unwarrantable violation of professional secrets which are ordinarily held to be inviolable.

At their meeting, on the 12th of August, 1889, the Board adopted the following resolution:

*Resolved*, That this board will not recognize as in good standing, any medical college which has graduated or is now graduating an average of *forty (40) per cent.* of its students during any consecutive five years.

**MEDICAL DEPARTMENT WILLAMETTE UNIVERSITY.**

PORTLAND, Ore. E. P. FRASER, M. D., Dean of the Faculty.

ORGANIZED in 1861, and located at Salem. It was removed to Portland in 1878. The first class was graduated in 1867. Classes have been graduated in each subsequent year.

Faculty consists of ten professors, four lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** Preliminary course of lectures September 16 to October 7. The session of 1890-91 began October 7, 1890, and will continue six months. **A three years' graded course is required.** Instruction imparted by didactic and clinical lectures, practical work in dissecting room, chemical and physiological laboratories, and by daily quizzes upon the subjects of the preceding lectures. Women admitted on same terms as men.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, diseases of children, medical jurisprudence, diseases of the mind and nervous system, hygiene, ophthalmology and otology, microscopy, toxicology, laryngology, dental pathology and syphilology.

**REQUIREMENTS:** For admission—1) credible certificate of good moral character; 2) diploma of graduation from a good literary or scientific college or high school, or a first grade teacher's certificate; or, lacking this, a thorough examination in the branches of a good English education, including mathematics, English composition, and elementary physics and natural philosophy.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) must have been engaged in the study of medicine at least three years, and **attended three full courses of lectures of six months each**; 4) must have attended at least two courses of clinical instruction and of practical anatomy; 5) thesis; 6) satisfactory written examination.

**FEES:** Matriculation, \$5; demonstrator, \$10; lectures, \$120; graduation, \$30; single tickets, \$20 each branch.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	32	13	40.6
1881-82	29	9	33.3
1882-83	28	10	35.7
1883-84	24	10	41.6
1884-85	23	8	34.8
1885-86	20	7	35
1886-87	17	6	35.3
1887-88	23	5	21.7
1888-89	41	12	29.2
1889-90	30	16	53.3

Percentage of graduates to matriculates for past ten years 35.9.

**The faculty earnestly recommends a four years' course of study.**

#### UNIVERSITY OF THE STATE OF OREGON, MEDICAL DEPARTMENT.

PORTLAND, Ore. S. E. JOSEPHI, M. D., Dean, 135 First street.

ORGANIZED in 1887.

The faculty embraces fifteen professors, one demonstrator and five special lecturers.

**COURSE OF INSTRUCTION:** Preliminary session began September 10, 1890. The fourth regular session began October 1, 1890, and will continue a period of six months. **A three years' graded course required.** Women admitted upon the same terms as men. In addition to didactic and clinical lectures, instruction will be given by practical work in the dissecting rooms and laboratories, and by repeated oral examinations.

Lectures embrace surgery, chemistry, toxicology, theory and practice of medicine, anatomy, materia medica and therapeutics, microscopy, obstetrics, gynecology, physiology, psychological medicine, ophthalmology, otology, diseases of throat and nose, genito-urinary diseases, clinical surgery, diseases of children, dermatology, hygiene, medical jurisprudence, histology, pathology, military surgery and zymotic diseases.

**REQUIREMENTS:** For admission, candidates having a degree in the arts or sciences or presenting a certificate from a high school or other institution in good standing, and matriculants of regular medical colleges requiring preliminary examination, will be admitted, without examination; lacking any of these, must give satisfactory evidence of knowledge of the common English branches, including reading, writing, spelling, grammar, geography and arithmetic.

For graduation: 1) good moral character and twenty-one years of age; 2) three years' of study; 3) **three full courses of lectures**; 4) one course of dissections; 5) two courses in practical anatomy and clinical instruction; 6) satisfactory examinations.

**FEES:** Matriculation, (once only), \$5; lectures, \$120; demonstrator, each course, \$10; graduation, \$30; single tickets, \$20 each.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1887-88	19	7	36.8
1888-89	20	5	25
1889-90	19	8	42.1

Percentage of graduates to matriculates for past three years, 34.4.



## PENNSYLVANIA.

### UNIVERSITY OF PENNSYLVANIA, DEPARTMENT OF MEDICINE.

PHILADELPHIA, Pa. JAMES TYSON, M. D., Dean. Thirty-sixth street and Woodland ave.

ORGANIZED in 1765 as the Department of Medicine of the College of Philadelphia, the sixth in the order of succession of American colleges, being chartered chiefly through the influence of Dr. BENJAMIN FRANKLIN and Rev. WILLIAM SMITH, D. D., and Dr. JOHN MORGAN. The first medical diploma issued in America was granted to Dr. JOHN ARCHER, in 1768, by this department, then known as the College of Medicine in Philadelphia. On the organization of the University of Philadelphia, in 1782, the college assumed its present title and relations, the successor of the College of Philadelphia. Classes have been graduated each year since 1768, except in 1772 to 1779, inclusive, during the War of Independence.

Faculty consists of fourteen professors, two assistant professors, one auxiliary professor, six clinical professors, forty demonstrators, lecturers and instructors.

**COURSE OF INSTRUCTION:** Sessions of 1890-91—"The spring session began May 5, and ended June 5, 1890; the preliminary session began September 22, 1890; the winter session began October 1, 1890, and ends in May, 1891. Attendance upon three winter sessions is obligatory. **The course is graded and extends over three years. A four-years' graded course is earnestly recommended and provided for, but not required.**

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology and morbid anatomy, surgery, embryology, obstetrics and gynecology, pharmacy, hygiene, medical jurisprudence, ophthalmology and otology, dermatology, toxicology, histology and diseases of children. This enumeration is to be understood as including the collateral studies and special branches of the general subjects.

**REQUIREMENTS:** For admission—A collegiate degree, or a certificate of having passed the matriculation examination of a recognized college; or a certificate, covering the required subjects, from a recognized normal or high school, or from a duly organized county medical society that has instituted a preliminary examination; or a preliminary examination embracing first, a brief essay, not exceeding a page of foolscap, which shall serve as a test of qualifications in orthography and grammar; second, an examination in the elementary principles of physics, on the subjects considered, in Part I of Fownes' Chemistry.

For graduation—1) twenty-one years of age; 2) a good moral character; 3) three years' study; 4) **three full courses of lectures;** 5) satisfactory examinations and attendance on practical instruction in all departments.

Students who have attended one course in a regular medical school are admitted as students of the second course in the University of Pennsylvania, after having passed a satisfactory examination in general chemistry, materia medica and pharmacy, histology and the elements of general pathology. Students who have attended two courses in a regular medical school are admitted as students of the third course in this institution, after having satisfactorily passed an examination in general and medical chemistry, materia medica and pharmacy, histology, anatomy and physiology, and the elements of general pathology. Graduates of other regular medical schools in good standing are admitted as students of the third class without examination. Graduates of colleges of pharmacy and dental education in good standing are admitted to the second course on passing the admission examination only.

**FEES:** Matriculation, \$5; lectures, including laboratory and dissection for each year, \$150; spring session, \$30; special courses, \$15 to \$25 each; fee for endorsement of diplomas granted by other schools, \$30, after personal examination of graduates.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	874	115	30.7
1881-82	363	122	33.6
1882-83	367	104	28.3
1883-84	367	103	28+
1884-85	370	108	29.1
1885-86	381	118	30.9
1886-87	400	99	24.7
1887-88	429	118	27.5
1888-89	444	128	28.8
1889-90	485	117	24.1

Percentage of graduates to matriculates for past ten years, 28.4.

**REMARKS:** During the first and second years, much of the student's time is occupied with practical work in the various laboratories of chemistry, pharmacy, osteology, histology and pathological histology, and in dissecting; but throughout the second and third sessions he is required to attend the general medical and surgical clinics of the University and Philadelphia hospitals, while special clinical facilities are provided for the third year. In this year each student receives besides instruction in clinical medicine and surgery, in physical diagnosis, laryngology, surgery and gynecology. Opportunities are afforded for

the practical study of diseases of the eye, ear, throat and skin, and for acquiring proficiency in the use of the various instruments employed in their treatment. For this purpose the third year class is divided into sections of convenient size, each of which receives direct personal instruction in the various practical subjects above mentioned. Advanced students may make original researches in the laboratories of pharmacy, chemistry, physiology, pathology and experimental therapeutics. The Auxiliary Department of Medicine supplements the customary winter course of medical instruction by lectures on collateral branches of science, essential to the thorough education of the physician. The course is essentially post-graduate.

### Arrangements are being made for four annual courses of lectures.

#### JEFFERSON MEDICAL COLLEGE.

PHILADELPHIA, Pa. J. W. HOLLAND, M. D., Dean, 1914 South Rittenhouse Square.

CHARTERED in 1826 as the Medical Department of the Jefferson College at Cannonsburg, Pa. The first class was graduated in 1826. Classes have been graduated each subsequent year.

Faculty consists of eight professors, two honorary professors, one lecturer, eight clinical lecturers, twelve demonstrators and sixteen assistant demonstrators.

**COURSE OF INSTRUCTION:** Session of 1890-91—A preliminary fall session began September 23, and continued until the opening of the winter session; the regular winter session commenced September 30, 1890, and ends the middle of April; the spring session begins in April and ends the last day of May, 1891. Daily clinics at hospital and dispensaries. **A three years' graded course is required.**

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, ophthalmology, otology, diseases of children, dermatology, toxicology, histology, genito-urinary diseases, pharmacy, orthopædics, laryngology, rhinology and neurology.

**REQUIREMENTS:** For admission—An official certificate of suitable preliminary education, a college diploma, or an examination in the branches of a good English education, and in elementary physics.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) **three full courses of lectures**; 4) satisfactory written examination. Students of dental colleges where a five months' winter session is held, and where full courses are given on anatomy, materia medica, physiology and chemistry, may become candidates, after attendance on two courses at such colleges, and two full courses at the Jefferson Medical College. Students of colleges of pharmacy where full courses are given on materia medica and chemistry, may become candidates, after attendance on two courses at such colleges, and two courses at the Jefferson Medical College.

**FEES:** Matriculation (paid once only), \$5; lectures, first two sessions, each \$140; third session, \$100; no diploma fee; spring course, \$35; all other practical courses free.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	609	205	33.6
1881-82	630	247	39.2
1882-83	569	227	39.8
1883-84	645	215	33.3
1884-85	493	176	35.7
1885-86	531	223	42.
1886-87	504	187	37.1
1887-88	484	188	38.8
1888-89	518	212	40.9
1889-90	584	220	37.6

Percentage of graduates to matriculates for past ten years, 37.7.\*

Names of matriculates not printed in the announcement.

#### PENNSYLVANIA MEDICAL COLLEGE.

PHILADELPHIA, Pa.

ORGANIZED in 1839 as the Medical Department of the Pennsylvania College at Gettysburg, by Dr. George McClellan. In 1859 it merged with the Philadelphia College of Medicine and Surgery, the faculty of the latter becoming the faculty of the former under the name of the former. It closed in 1861 on account of the confused state of the country, and the desire of many of the professors to enter the medical staff of the army.

\*A number of students of this school have attended one or more courses of lectures elsewhere.

## PHILADELPHIA COLLEGE OF MEDICINE AND SURGERY.

PHILADELPHIA, Pa.

ORGANIZED in 1846 by Dr. James R. McClintock, and in 1859 it was merged into the Pennsylvania Medical College.

## FRANKLIN MEDICAL COLLEGE.

PHILADELPHIA, Pa.

CHARTERED in 1847.—Extinct in 1852.

## HOMEOPATHIC MEDICAL COLLEGE.

PHILADELPHIA, Pa.

ORGANIZED in 1848. United with the Hahneman Medical College of Philadelphia, April 2, 1869, which see.

## HAHNEMANN MEDICAL COLLEGE AND HOSPITAL.

(Homeopathic.)

PHILADELPHIA, Pa. A. R. THOMAS, M. D., Dean, 113 South 16th street.

ORGANIZED in 1848. First class was graduated in 1849. Classes have been graduated each subsequent year.

Faculty consists of nine professors, one associate professor, nine lecturers and four demonstrators.

**COURSE OF INSTRUCTION:** The session of 1890-91 embraces a preliminary course of one week's duration which precedes the regular winter course. The latter began September, 29, 1890, and continues until the last of March, 1891. A spring course begins on the Monday following commencement and continues until June. **A three years' graded course is obligatory and a four years' graded course is offered.** Clinics at hospital and dispensary. "Quizzes, demonstrations, experiments and other practical exercises will be called into requisition as aids in the work of imparting instruction."

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, institutes of homeopathy, microscopy and histology, botany and pharmacy, toxicology, ophthalmology and otology, pædology, laryngology, diseases of children, history of medicine, insanity, dermatology and physical diagnosis.

**REQUIREMENTS:** For admission—"Each student will be required to present a preceptor's certificate that he possesses a good moral character, and that he is otherwise qualified for the study of medicine. He must give evidence of a good education, and pass a satisfactory examination in elementary mathematics, composition and elementary physics or natural philosophy. Candidates exhibiting the diploma of a literary or scientific college or high school, or a county or State teacher's certificate, or the certificate of an examining board of any accredited medical society, will be admitted without examination."

For graduation: 1) twenty-one years of age; 2) good moral and professional character; 3) three years' study; 4) **three full graded courses of lectures**; 5) at least one course of practical anatomy, histology, chemistry, obstetrics and surgery; 6) satisfactory examination.

**FEE:** Matriculation, \$5; lectures, including practical courses, \$100 per year; graduation, \$50.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	208	83	39.9
1881-82	148	57	38.5
1882-83	147	52	35.4
1883-84	138	41	39.7
1884-85	144	48	33.3
1885-86	148	58	39.1
1886-87	166	48	28.9
1887-88	173	48	27.7
1888-89	186	65	34.9
1889-90	188*	64	34+

Percentage of graduates to matriculates for past ten years, 34.1.

**For requirements of the American Institute of Homœopathy in regard to admission and graduation in 1892, see Introductory Remarks.**

\*Not including fifteen graduates who matriculated.

## WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA.

PHILADELPHIA, Pa. CLARA MARSHALL, M. D., Dean, 131 South Eighteenth street.

**ORGANIZED IN 1850.** The first class was graduated in 1851. Classes have been graduated in each subsequent year.

Faculty consists of ten professors, nine lecturers, one instructor, five demonstrators, three assistant demonstrators, a curator of museum, prosecutor and one associate lecturer.

**COURSE OF INSTRUCTION:** The regular winter term of the session of 1890-91 began October 1, 1890, and closes May 6, 1891. **A three years' graded course is required for graduation, and a four years' course is earnestly recommended.** Weekly examinations on each subject, as presented in the lectures. Attendance obligatory. The degree of Doctor of Medicine, *cum laude*, will be conferred on students taking a four years' course who, in addition to the examinations for the degree, shall have obtained an average of 75 per cent. in examinations upon four specialties in medicine and surgery.

Lectures embrace anatomy, physiology, chemistry and toxicology, materia medica and therapeutics, principles and practice of medicine, pathology, principles and practice of surgery, obstetrics, gynecology and diseases of women and children, hygiene, medical jurisprudence, histology and microscopy, laryngoscopy and rhinoscopy, dermatology, otology and ophthalmology, pharmacy, dental physiology, diseases of the nervous system and orthopedic surgery.

**REQUIREMENTS:** For admission—"All applicants for admission to the college, before matriculating, must pass an entrance examination in the following branches: 1) penmanship, orthography and English composition by means of a page written at the time and place of examination; 2) elementary physics as presented in Avery's Physics; 3) arithmetic, including fractions and percentage; 4) Latin, including the regular declensions of Latin nouns and adjectives, and the conjugation of the regular Latin verbs. Applicants bringing a diploma or a certificate, from a recognized college or school, or from a duly organized County Medical Society which has instituted a preliminary examination (such as that adopted by the Medical Society of the State of Pennsylvania), or a teacher's certificate from a County Superintendent of Schools, will not be required to pass the entrance examination, provided such diploma or certificate shall include the subjects of the examination as stated above. No examination will be required of students, desiring to pursue special branches in the college, who do not intend to apply for the degree in medicine."

For graduation: 1) twenty-one years of age; 2) three years' study; 3) **three winter courses**, including, at the least, two full courses of lectures on each of the following subjects—chemistry and toxicology, anatomy, physiology and hygiene, materia medica and general therapeutics and pathology, principles and practice of medicine, principles and practice of surgery, obstetrics, gynecology and diseases of children, and one course of lectures on histology, two courses in practical anatomy; having made creditable dissection of each part of the cadaver; one course in the chemical, the physiological, the histological, the pharmaceutical, and the pathological laboratories; one course in operative and minor surgery, in practical obstetrics and gynecology, and satisfactory evidence of having attended two courses of clinical instruction each, in medicine, surgery, obstetrics and gynecology; 4) good moral character and mental fitness for the profession; 5) thesis; 6) satisfactory examinations.

**FEES:** Matriculation (paid once only), \$5; lectures, first year, \$100; second year, \$105; third year, \$85; laboratory tickets, first year, \$20; second year, \$10; demonstrator, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	170	20	11.7
1881-82	111	19	17.1
1882-83	125	35	28
1883-84	133	26	19.5
1884-85	126	23	18.2
1885-86	142	33	23.2
1886-87	154	30	19.4
1887-88	161	27	16.7
1888-89	173	36	20.8
1889-90	180*	40	22.2

Percentage of graduates to matriculates for past ten years, 19.5.

---

\*Not including one graduate who matriculated.

## PENN MEDICAL UNIVERSITY.

PHILADELPHIA, Pa.

CHARTERED February 2, 1853. Lectures were delivered until 1867. Re-organized in 1874.—Extinct in 1881.

## AMERICAN COLLEGE OF MEDICINE IN PENNSYLVANIA, AND THE ECLECTIC MEDICAL COLLEGE OF PHILADELPHIA.

INCORPORATED February 26, 1853.

A few years after incorporation the first name was dropped, leaving the title Eclectic Medical College of Philadelphia. This was changed by the Legislature on March 21, 1865, to the Philadelphia University of Medicine and Surgery.

## ECLECTIC MEDICAL COLLEGE OF PENNSYLVANIA.

PHILADELPHIA, Pa.

INCORPORATED, 1856.—Extinct in 1880. After being in operation a few years, this institution passed into the hands of Buchanan, and became fraudulent.

## PHILADELPHIA UNIVERSITY OF MEDICINE AND SURGERY.

*(Eclectic.)*

PHILADELPHIA, Pa.

INCORPORATED in 1865. Fraudulent.—Extinct in 1880.

## AMERICAN UNIVERSITY OF PENNSYLVANIA.

*(Eclectic.)*

PHILADELPHIA, Pa.

INCORPORATED in 1867. Fraudulent.—Extinct in 1880.

## LINCOLN UNIVERSITY, MEDICAL DEPARTMENT.

OXFORD, Pa.

ORGANIZED in 1870.—Extinct in 1872.

## MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA

PHILADELPHIA, Pa. E. E. MONTGOMERY, M. D., Secretary, 1818 Arch street.

INCORPORATED by the legislature, 1850.

ORGANIZED in 1881. The first class was graduated in 1882.

Faculty consists of thirteen professors, two honorary professors, one adjunct professor, eleven lecturers, nine demonstrators, one director of laboratory of pathology, one assistant demonstrator and five instructors.

**COURSE OF INSTRUCTION:** The college year is divided into three sessions—the winter session, on which alone attendance is required, preceded by a preliminary session of three weeks; and the spring session. The introductory course for the session of 1890-91 began September 8, 1890. The winter session began October 1, 1890, and ends April 16, 1891. The spring session begins on Thursday, April 20, 1891, and lasts until June 20, 1891. **A three years' graded course is required to complete the curriculum, while a four years' courses is recommended.** Daily quizzes by the professors.

Post-graduate course—Graduates of regular medical colleges in good standing are permitted to enter any of the courses of study. A certificate of actual attendance will be given upon request. The degree of M. D. *summa cum Laude*, is given to those students who attend four years' sessions, and pass examination averaging above ninety.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, syphilis, bacteriology, medical jurisprudence, histology, ophthalmology and otology, orthopedic and oral surgery, laryngology, vaccinia, mental and nervous diseases, pharmacy, electro-therapeutics, diseases of children, dermatology. Clinics at hospital and full facilities for laboratory work afforded.

REQUIREMENTS: For admission—Good moral character. "Candidates for admission shall be required: 1) to write an essay (one page foolscap) as a test of orthography and grammar; 2) pass an examination in English history, elementary physics, mathematics and Latin grammar. A candidate who has received a degree in arts, philosophy or science; a certificate of examination and graduation from an academy, high or normal school which does not confer degrees, or a certificate of having passed a satisfactory examination of a duly organized county medical society, or one of the board of censors of this school, may enter without examination."

Students having attended one course in a regular medical college are admitted to the second year of the college course upon passing a satisfactory examination in the studies of the first year. Students who have attended two courses are admitted to the third year upon a satisfactory examination in the studies of the first and second years. Graduates of regular medical schools having a *three years' graded course* are admitted to the fourth year without an examination. Graduates of colleges of pharmacy and dental colleges in good standing are admitted to the second year after passing the entrance examination only.

For graduation: 1) twenty-one years of age and good moral character; 2) satisfactory examination in all the branches of the curriculum, and that his last course of instruction shall have been spent in this school; 3) presence at the commencement, unless excused by the faculty; 4) **at least three full courses of lectures.**

FEES: Matriculation (paid but once), \$5; general ticket first and second years, \$75 each; third and fourth years each, \$100; no graduation fee; \$5 each for the departments of histology, pharmacy, chemistry, operative surgery and bacteriology; spring session, \$25; fee for examination for endorsement of diplomas of graduates of other schools, \$25.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	31	3	9.6
1882-83	27	10	37
1883-84	23	4	17.3
1884-85	53	5	15.1
1885-86	26	5	19.2
1886-87	80	15	18.7
1887-88	108	20	18.5
1888-89	136	30	22
1889-90	119*	25	21+

Percentage of graduates to matriculates for past nine years, 24.2.

## WESTERN PENNSYLVANIA MEDICAL COLLEGE.

PITTSBURGH, Pa. T. M. T. McKENNAN, M. D., Secretary, 810 Penn avenue.

ORGANIZED IN 1886.

Faculty consists of twenty professors, three demonstrators, ten assistants to chairs, three lecturers and one prosector to chair of anatomy.

COURSE OF INSTRUCTION: The session of 1890-91 began September 23, and will continue six months. This will be followed by a spring course of ten weeks. Instruction imparted by didactic and clinical lectures, recitations, demonstration, laboratory work and practice in diagnosis. Lectures to be illustrated by clinical cases, charts, manikins, models, prepared specimens, dissections, microscopical and chemical experiments and other practical demonstrations. A *three years' graded course* is recommended but not required.

Lectures embrace materia medica and therapeutics, chemistry, histology, anatomy, physiology, hygiene, principles and practice of medicine, principles and practice of surgery, obstetrics, clinical medicine and surgery, orthopedic surgery, surgery of genito-urinary organs, ophthalmology, otology, laryngology, dermatology, diseases of children, mental and nervous diseases, medical jurisprudence and microscopy, dietetics and rhinology.

REQUIREMENTS: For admission—"Students will be required to show the possession of an education, sufficiently comprehensive to enable them to pursue the study of medicine with advantage. A preliminary examination will not be required of those holding degrees from recognized colleges, or diplomas from normal or high schools in good standing, or certificates from examiners of any county medical society conforming to the requirements of the Pennsylvania State Medical Society, or having passed the matriculation examination of any other regular medical college in good standing."

\*Not including six graduates who took special courses.

For graduation: 1) twenty-one years of age and good moral character; 2) must have studied medicine three years and have taken at least two full courses of lectures; 3) satisfactory examination in all branches taught in the college.

**FEES:** Matriculation, annually, \$5; lectures and clinics, \$100; demonstrator, \$10; graduation \$25; single tickets, \$20 each branch; spring session, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported and percentage of graduates to matriculates—

Session,	Matriculates.	Graduates.	Percent.
1886-87	57	21	36.8
1887-88	85	35	41.1
1888-89	105	37	35.2
1889-90	112	29	25.8

Percentage of graduates to matriculates for past four years, 33.9.

**After the session of 1890-91 attendance upon three regular courses of lectures and four years of study will be required as conditions of graduation.**

## RHODE ISLAND.

### MEDICAL DEPARTMENT OF BROWN UNIVERSITY.

PROVIDENCE, R. I.

ORGANIZED IN 1811. "Lectures were delivered and classes graduated annually from 1814 to 1827 inclusive, except the year 1820-21, when it is believed that no classes were graduated."

## SOUTH CAROLINA.

### THE BOARD OF MEDICAL EXAMINERS OF THE STATE OF SOUTH CAROLINA.

DARLINGTON, S. C. JAS. C. WILLCOX, Secretary.

The South Carolina Medical Practice Act provides that the Board shall meet regularly on the first Tuesday in April and the third Tuesday in August. Special meetings may be called if applicants pay the expenses of such meetings. The examination fee is \$5.

Under the law as first passed, 20 graduates of the Medical College of the State of South Carolina were licensed, without examination, on their diplomas.

The following table shows the work of the Board:

INSTITUTIONS REPRESENTED BY THE APPLICANTS. BEFORE THE BOARD OF MEDICAL EXAMINERS OF SOUTH CAROLINA, January 1, 1889, to December 11, 1890.	Total applica- tions	Licenses is- sued	Licenses re- fused
University of the City of New York, Medical Department	11	11	.....
College of Physicians and Surgeons, Baltimore, Md.	4	3	1
Vanderbilt University, Medical Department, Nashville	3	3	.....
Medical College of the State of South Carolina	67	55	12
Howard University, Medical Department, D. C.	1	1	.....
University of Maryland, School of Medicine, Baltimore	24	20	4
University of Pennsylvania, Department of Medicine, Philadelphia	2	2	.....
University of Georgia, Medical Department, Augusta	18	8	10
Atlanta Medical College, Atlanta, Georgia	2	2	.....
Baltimore Medical College	3	2	1
Leonard Medical School, N. C., (colored)	2	2	.....
College of Physicians and Surgeons, New York City	1	1	.....
Tulane University of Louisiana, Medical Department	3	3	.....
University of Tennessee, Medical Department, Nashville	2	1	1
Louisville Medical College, Kentucky	13	2	11
Central University, Hospital College of Medicine, Louisville	4	1	3
New York Homeopathic Medical College, New York	1	.....	1
Meharry Medical Department of Central Tennessee College, (colored) Nashville	3	1	2
Kentucky School of Medicine, Louisville, Ky.	3	2	1
Baltimore University, School of Medicine, Baltimore, Md.	2	.....	2
Southern Medical College, Atlanta, Ga.	1	1	.....
<b>Totals</b>	<b>170</b>	<b>121</b>	<b>49</b>

# MEDICAL COLLEGE OF SOUTH CAROLINA.

CHARLESTON, S. C.

ORGANIZED in 1824; charter obtained in 1823. Permanently closed in 1839. During its existence its graduates numbered 313.

## MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA.

CHARLESTON, S. C. R. A. KINLOCH, M. D., Dean, 235 Meeting street.

ORGANIZED in 1832. In 1839 the Medical College of South Carolina was merged into it, the Medical College of the State of South Carolina receiving all the apparatus, buildings and other property of the former. [PROLEAU—see Medical College of South Carolina.] Classes were graduated annually until 1863, when operations were suspended during the war, and until 1865, when they were resumed. Classes have been graduated annually since 1865.

Faculty consists of nine professors, one demonstrator, one assistant demonstrator and three teachers.

COURSE OF INSTRUCTION: The sixty-second session began October 15, 1890, and will close early in March 1891, embracing a period of twenty weeks. Clinics at hospital.

### Graded course of three years required.

Lectures embrace principles and practice of surgery, medical jurisprudence, clinical surgery, histology, pathology, practice of medicine, clinical medicine, physiology, chemistry, hygiene, anatomy, ophthalmology and otology, obstetrics, gynecology, materia medica and therapeutics, microscopy, laboratory instruction (compulsory on first course students.)

REQUIREMENTS: For admission—A preliminary education satisfactory to the faculty.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years study; 4) **three full courses** of lectures and two of dissections; 5) examinations in all the branches.

FEES: Matriculation, \$5; lectures, including demonstrator's and one hospital ticket, \$100; graduation, \$30; laboratory fee, \$5.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	77	21	27.
1881-82	56	19	33.9
1882-83	61	18	29.5
1883-84	80	20	25.
1884-85	59	17	28.8
1885-86	62	18	29+
1886-87	51	18	35.2
1887-88	61	17	27.8
1888-89	74	25	33.7
1889-90	57	23	40.3

Percentage of graduates to matriculates for past five years, 33.1.

REMARKS: Pharmacy students are included in the number of matriculates here given prior to the session of 1885-86, thus affecting the proportion of graduates to matriculates.

## UNIVERSITY OF SOUTH CAROLINA, MEDICAL DEPARTMENT.

COLUMBIA, S. C.

ORGANIZED in 1866.—Extinct in 1876.

## TENNESSEE.

### BOARD OF MEDICAL EXAMINERS, STATE OF TENNESSEE.

TRENTON, TENN. T. J. HAPPEL, M. D., Secretary.

This Board held its first meeting for examination at Nashville, February 18-19, 1889. There were eleven candidates, of whom three failed to pass.

According to the report of the Secretary made in April, 1890, there are in the whole State 3,261 practitioners holding certificates, of whom 1,653 are graduates. Of the graduates, 1,578 are physicians, 19 homeopaths and 61 eclectics. The Secretary says that there are many unregistered practitioners in the State, some having purposely failed to register and suggests that violation of the law be made a misdemeanor in addition to all other penalties. The Medical Practice Act (see this REPORT 1890) is considered imperfect in several respects, and a number of amendments are suggested as follows:



"In the regular ranks much opposition has been engendered to the bill by the use of the terms 'allopath' and 'allopathic.' Hence, I would suggest the propriety of amending the act by striking out the words 'allopath' and 'allopathic,' wherever they may occur, and inserting the word 'regular.' Sec. I of the act might be further amended with advantage by adding another clause at the end of said section as follows: 'Provided that after Jan. 1st, 1892, no certificate shall be issued to any one without an examination by the Board as to his fitness to practice medicine and its kindred branches, surgery and obstetrics, in the State.'"

Amend Sec. III by striking out after the expression "in good standing" the clause commencing with "and" and ending with "Association." The object of this amendment is to leave the matter of colleges whose diplomas are to be recognized to be determined by the Board, surrounded by limitations as to the different "isms" as provided by the rest of the act, so as to conform to Section I.

At the end of Sec. III add as follows: "Provided, that from and after Jan. 1st, 1892, all parties shall be required to undergo a satisfactory examination in the presence of the whole Board as to their fitness to practice medicine."

Sec. IV should be amended so as to change the expression "three months" into "six months," so as to make Sec. IV conform to Sec. V as to the length of time a rejected applicant must wait before he can apply for re-examination.

Sec. XII should be amended so as to fix the price of a certificate issued by the Board at five dollars instead of one dollar—attain that end strike out the expression "one dollar" where it first appears in said section and insert "five dollars."

Add also at the end of Sec. XII as follows: "In addition to all other fees, a fee of 25 cents shall be paid by the applicant for registration, to the secretary of the Board, for issuing and recording any certificate. Also amend by allowing per diem to members of the Board for the whole time of necessary absence from home in attendance on the meetings—counting the time of the shortest route going and coming."

Sections XIII and XIV should both be amended so as to make any violation of either or both a misdemeanor punishable by fine for the first offense and by fine or imprisonment or both for subsequent offenses; the imprisonment to be at the discretion of the court, and to be in the county jail not less than one nor more than ten months. The fine in every case, if collected in money, should be paid over to the Board of Medical Examiners to be used by them, as are all other funds coming into their hands.

This would (if the amendments are adopted) eliminate the matter of "action of debt" from the act and enable the Board to force a compliance with its provisions. The remaining portion of the section should not be changed.

Sec. XVI should be amended by inserting after the words "by them" the following clause "or by the county court clerk of any county in the State of Tennessee," to carry out an idea already advanced. Then there should be added after section 17 a new section 17½ as follows:

Sec. 17½. Be it further enacted, that inquisitorial powers are hereby given to grand juries, and it is made their duty to inquire into all violations of this act and to make presentments for the same.

Of the 3,261 practitioners registered in Tennessee up to April, 1890, there were 1,658 graduates of medical schools. These were distributed by schools of practice as follows: Physicians 1,578, Homeopathic 19, Eclectic 61. The schools of graduation were as follows:

Medical College of Alabama, Mobile, Alabama.....	5
National Medical College, Washington, D. C.....	2
Howard University, Medical Department, Washington.....	2
? "Washington Medical College, Washington".....	2
Medical College of Georgia, Augusta, Georgia.....	5
Savannah Medical College, Savannah.....	1
Atlanta Medical College, Atlanta.....	18
Reform Medical College of Georgia, Macon.....	6
Georgia College of Eclectic Medicine and Surgery, Atlanta.....	2
Rush Medical College, Chicago, Illinois.....	12
Chicago Medical College, Chicago.....	4
Bennett College of Eclectic Medicine and Surgery, Chicago.....	1
Chicago Homeopathic Medical College, Chicago.....	2
Medical College of Indiana, Indianapolis, Indiana.....	7
Medical Department of Butler University, Indianapolis.....	1
Medical College of Evansville, Evansville, Indiana.....	3
Indiana Eclectic Medical College, Indianapolis.....	1
College of Physicians and Surgeons, Keokuk, Iowa.....	2
University of Louisville, Medical Department, Louisville, Kentucky.....	120
Kentucky School of Medicine, Louisville.....	10
Louisville Medical College, Louisville.....	76
Hospital College of Medicine, Louisville.....	9
Medical Department of Transylvania University, Lexington.....	21
Medical Department, Tulane University of Louisiana, New Orleans, Louisiana.....	6
University of Louisiana, New Orleans.....	13
New Orleans School of Medicine, New Orleans.....	5
University of Maryland, School of Medicine, Baltimore, Maryland.....	9
Washington University, School of Medicine, Baltimore.....	6
College of Physicians and Surgeons, Baltimore.....	14
Baltimore Medical College, Baltimore.....	6
Baltimore University, School of Medicine, Baltimore.....	1

Johns Hopkins University, Medical Department,* Baltimore.....	1
Harvard University Medical School, Boston, Massachusetts.....	1
Department of Medicine and Surgery of the University of Michigan, Ann Arbor, Mich..	9
Missouri Medical College, St. Louis, Missouri.....	9
St. Louis Medical College, St. Louis.....	11
American Medical College, St. Louis.....	4
St. Louis Eclectic Medical College, St. Louis.....	1
St. Joseph Medical College, St. Joseph.....	1
Dartmouth Medical College, Dartmouth, New Hampshire.....	1
College of Physicians and Surgeons, New York City.....	3
Albany Medical College, Albany.....	3
University of the City of New York, Medical Department.....	26
Bellevue Hospital Medical College, New York City.....	44
Long Island College Hospital, Brooklyn.....	3
Medical Department of the University of Buffalo, Buffalo.....	1
New York Medical College, New York.....	3
United States Medical College, New York.....	1
New York Free Medical College for Women, New York.....	1
New York Homeopathic Medical College for Women.....	1
Medical College of Ohio, Cincinnati, Ohio.....	21
Western Reserve University, Medical Department, Cleveland.....	3
Starling Medical College, Columbus.....	1
Pulte Medical College, Cincinnati.....	5
Toledo Medical College, Toledo.....	1
Homeopathic Hospital Medical College, Cleveland.....	11
Cincinnati College of Medicine and Surgery, Cincinnati.....	5
Columbus Medical College, Columbus.....	1
Physio-Medical College, Cincinnati.....	5
Botanico-Medical College, Cincinnati.....	2
Eclectic Medical Institute of Cincinnati.....	31
National Normal University, Lebanon, Ohio.....	1
Jefferson Medical College, Philadelphia, Pennsylvania.....	84
University of Pennsylvania, Philadelphia.....	62
Pennsylvania Medical College, Philadelphia.....	5
Philadelphia Medical College, Philadelphia.....	7
Penn Medical University, Philadelphia.....	1
Woman's Medical College of Pennsylvania, Philadelphia.....	1
Hahnemann Medical College, Philadelphia.....	5
Homeopathic Medical College, Philadelphia.....	1
Medical College of the State of South Carolina, Charleston, South Carolina.....	7
Vanderbilt University, Nashville, Tennessee.....	333
University of Nashville, Nashville.....	252
Nashville Medical College, Nashville.....	136
Medical Department, University of Tennessee.....	117
Shelby Medical College, Nashville.....	7
Meharry Medical Department of Central Tennessee College, Nashville.....	20
Memphis Hospital Medical College, Memphis.....	82
Botanico Medical College, Memphis.....	4
Vermont Academy of Medicine, Castleton, Vermont.....	3
University of Virginia Medical Department, Charlottesville, Virginia.....	7
Medical college of Virginia, Richmond.....	11
McGill University, Faculty of Medicine, Montreal, Quebec.....	1
University of Bonn, Bonn, Germany.....	1
University of Straesburg, Strassburg, Germany.....	1
Royal College of Physicians and Surgeons, London, England.....	1
? "Mexico Medical College, Mexico".....	1
? "Queen's Medical College, Weymouth".....	1
Royal College of Physicians and Surgeons, Kingston, Ontario.....	1†

The colleges preceded by a ? mark have not and have never had any existence.

Of the 3,261 registered practitioners in Tennessee, 1,603 are non-graduates. There are, however, many practitioners in the State that have not registered, and it is probable that the majority of these are non-graduates.

## MEDICAL DEPARTMENTS OF THE UNIVERSITY OF NASHVILLE AND VANDERBILT UNIVERSITY.

NASHVILLE, TENN. W. L. NICHOL, M. D., Registrar, Cor. of Cedar and High streets.

ORGANIZED in 1850, as the Medical Department of the University of Nashville, and assumed the present relation in 1874. The first class was graduated by the University of Nashville in 1852, and the first diploma was issued by the Vanderbilt University in 1875. Classes have been graduated annually by the respective universities since these dates.

Faculty consists of twelve professors, two lecturers, two demonstrators and one assistant demonstrator.

\* Has graduated no students of medicine.

† This list adds up 1,735 graduates.

**COURSE OF INSTRUCTION:** The course of 1890-91 opened with a preliminary session commencing September 1, 1890, continuing until the opening of the winter session October 5, which will end March 6, 1891. A three years' graded course is strongly recommended, but not required. Daily examinations held by professors. Clinics at hospital.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics, gynecology, hygiene, medical jurisprudence, ophthalmology and otology, psychology, histology, pharmacy and toxicology, diseases of children and microscopy.

**REQUIREMENTS:** For admission—**None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study; 4) two full courses of lectures; 5) dissection during one session; 6) satisfactory examinations.

**FEES:** Matriculation, \$5; demonstrator, \$10; lectures, \$75; graduation, \$25.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1879-80	311	141	45.3
1881-82	327	191	58
1882-83	246	116	47.1
1883-84	180	93	51.7
1884-85	181	73	40.3
1885-86	231	105	45.4
1886-87	207	82	39.6
1887-88	197	81	41.1
1888-89	237	82	34.5
1889-90	238*	126	43

Percentage of graduates to matriculates for ten years reported, 45.2.

#### JEFFERSON MEDICAL ASSOCIATION.

DANDRIDGE, TENN.

In 1854, this association obtained a charter from the Legislature of Tennessee giving it power to confer the degree of M. D. upon applicants who would present themselves before the members of said association for thorough examination, and if the examination was satisfactory to these gentlemen they could grant them a diploma. The degree of M. D. was conferred upon five persons a number of years ago. No degree has been conferred of late years, the association simply exercising the functions of a Medical Society. A diploma granted by this association in 1869 was recently filed for record in Indiana.

#### MEMPHIS MEDICAL COLLEGE.

(Medical Department, Cumberland University.)

MEMPHIS, TENN.

ORGANIZED in 1854. Suspended from 1861 to 1868. Reorganized in June, 1868, and in operation until the close of the session of 1872-73, when it became extinct.

#### BOTANIC MEDICAL COLLEGE.

MEMPHIS, TENN.

ORGANIZED in 1857.—In 1859 reorganized as the Eclectic Medical Institute, and became extinct in 1861.

#### SHELBY MEDICAL COLLEGE.

NASHVILLE, TENN.

ORGANIZED in 1858.—Extinct in 1862.

---

\*Not including one graduate who matriculated.

## MEDICAL DEPARTMENT, UNIVERSITY OF TENNESSEE.

*(Nashville Medical College.)*

NASHVILLE, Tenn. DUNCAN EYE, M. D., Dean of the Faculty, 700 Church street.

ORGANIZED IN 1876. Became connected with the University of Tennessee in 1880. The first class was graduated in 1878. Classes have been graduated each subsequent year.

The faculty consists of fifteen professors, three demonstrators and eleven assistants.

COURSE OF INSTRUCTION: The session of 1890-91 began September 1, 1890, with a preliminary course, which continued until the beginning of the regular winter course, October 1, 1890, the latter continuing five months. Provision is made for a three-years' graded course, which, however, is not obligatory. "The instruction at this college consists of didactic lectures with demonstrations, clinical teaching, examinations or quizzes, and practical teaching in subjects involving manipulation, by the regular faculty."

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, medical jurisprudence, state medicine, genito-urinary and venereal diseases, toxicology, diseases of children, oral surgery, ophthalmology and otology, pathology, laryngology and orthopedics.

REQUIREMENTS: For admission—"Certain States having enacted laws requiring literary qualifications of their students, all students hailing from such States who have not received a literary collegiate degree, or have not a certificate covering the required subject from a normal or high school, will be required to undergo an admission examination, such as is contemplated by the laws of said States."

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) dissections during attendance in this school; 5) satisfactory examination by the faculty.

FEES: Matriculation (paid but once), \$5; demonstrator, \$10; lectures, \$75; graduation, \$25. No fees but the above are allowed to be charged.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	134	55	41+
1881-82	144	69	47.9
1882-83	133	58	43.6
1883-84	167	62	31.7
1884-85	171	57	33.3
1885-86	174	56	32.1
1886-87	202	61	30.2
1887-88	212	75	35.3
1888-89	209	61	29.1
1889-90	246	98	39.8

Percentage of graduates to matriculates for past ten years 36.3.

## MEHARRY MEDICAL DEPARTMENT OF CENTRAL TENNESSEE COLLEGE.

NASHVILLE, Tenn. G. W. HUBBARD, M. D., Dean of the Faculty.

ORGANIZED IN 1876. The first class was graduated in 1877. Devoted to the education of colored students, male and female.

The faculty consists of seven professors, one assistant professor, three instructors, one lecturer and one demonstrator.

COURSE OF INSTRUCTION: The session of 1890-91 began September 23, 1890, and ends February 19, 1891. **A three years graded course is required.** Recitations in anatomy, chemistry and physiology, with laboratory work during first year's attendance.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, medical jurisprudence, microscopy, histology, botany, pharmacy, ophthalmology, otology, laryngology, toxicology, electro-therapeutics, hygiene and medical ethics.

REQUIREMENTS: For admission: "Applicants must be at least eighteen years of age, of good moral character, and pass examinations in arithmetic, geography, grammar, reading, writing and spelling, and elements of physics. Graduates of other recognized colleges and normal schools will, on presenting their diplomas, be admitted without examination. Students earnestly advised to obtain some knowledge of Latin."

For graduation: 1) Twenty-one years of age; 2) **three courses of lectures of not less twenty weeks each**; 3) must pass a satisfactory written examination in all the branches laid down in this course, "including the outlines of Bible history and doctrine;" 4) present an acceptable original thesis on some medical subject.

**FEES:** Tuition, \$25; hospital, \$5; graduation, \$10; materials for practical anatomy and chemistry at cost.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	35	3	8.5
1881-82	29	8	27.6
1882-83	30	5	16.6
1883-84	31	8	25.8
1884-85	38	8	21
1885-86	49	10	20.4
1886-87	54	10	18.5
1887-88	62	18	29.1
1888-89	55	14	25.4
1889-90	59	14	23.7

Percentage of graduates to matriculates for the past ten years, 22.1.

### MEMPHIS HOSPITAL MEDICAL COLLEGE.

(Medical Department Southwestern Baptist University.)

MEMPHIS, Tenn. F. L. SIM, M. D. Dean, 126 Hernando street.

ORGANIZED in 1880. The first class was graduated in 1881.

The faculty consists of ten professors, one demonstrator and an assistant.

**COURSE OF INSTRUCTION:** The annual session of 1890-90 began October 27, 1890, and will close the last of March, 1891. Daily quizzes by the professors. Clinical lectures at hospital and college.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics and gynecology, hygiene, ophthalmology, otology and laryngology, toxicology, diseases of the nervous system, diseases of children and pharmacy.

**REQUIREMENTS:** For admission—**None.**

For graduation: 1) twenty-one years of age; 2) good moral character; 3) two full courses of lectures; 4) dissection during two sessions; 5) satisfactory examination in all branches taught.

**FEES:** Matriculation, \$5; lectures, \$50; demonstrator, \$10; graduation, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	52	18	34.6
1881-82	70	30	42.8
1882-83	73	31	42.4
1883-84	58	22	38
1884-85	71	31	43.6
1885-86	90	37	41.1
1886-87	129	41	31.7
1887-88	145	54	37.2
1888-89	177	63	35.5
1889-90	196	63	32.2

Percentage of graduates to matriculates for past ten years, 36.7.

### TENNESSEE MEDICAL COLLEGE.

KNOXVILLE, Tenn. C. E. RISTINE, M. D., Registrar, 117 Prince street.

ORGANIZED in 1889. Faculty consists of eleven professors, and one demonstrator of anatomy; there are five members in the dental department.

**COURSE OF INSTRUCTION:** A preliminary course of lectures was given during the month of September. The regular winter course began October 1, 1890, and ends the middle of March, 1891.

"Practitioners who hold a license to practice, obtained from the State Board of Medical Examiners, by *examination*, may become candidates for graduation after one year's attendance upon lectures and taking a course in Practical Anatomy."

Attendance upon three full winter courses of lectures earnestly recommended, but not required.

Lectures embrace anatomy, physiology, materia medica and therapeutics, medical chemistry, theory and practice of medicine, surgery, orthopedics, obstetrics, gynecology, otology, ophthalmology, laryngology, rhinology, disease of the mind and nervous system, histology, medical jurisprudence, pathology and microscopy, laboratory work and instruction obligatory.

**REQUIREMENTS:** For admission—**None.**

For graduation: 1) at least twenty-one years of age; 2) good moral character; 3) two full winter courses of lectures; 4) study of medicine for not less than three years; 5) one course of dissections; 6) satisfactory examinations, oral and written.

**FEES:** Matriculation, \$5; lectures, \$60; demonstrator, \$10; graduation, \$16.

**STUDENTS:** Number of matriculates and of graduates reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1889-90	36	8	22.2

### CHATTANOOGA MEDICAL COLLEGE.

(Medical Department of U. S. Grant University, originally East Tennessee Wesleyan University.)

CHATTANOOGA, Tenn. E. A. CORLEIGH, M. D., Dean, 729 Chestnut street.

**ORGANIZED** in 1889. First class was graduated in 1890.

The faculty consists of twelve professors, two adjunct professors, five lecturers and one demonstrator.

**COURSE OF INSTRUCTION:** A preliminary course began September 15, 1890. The regular winter term began October 1, 1890, and will end March 15, 1891. A three years' course is recommended but not required. Women admitted on the same terms as men.

Lectures embrace anatomy, physiology, materia medica, therapeutics, chemistry, theory and practice of medicine, surgery, obstetrics, gynecology, diseases of children, toxicology, otology, ophthalmology, rhinology, laryngology, pathology, histology, microscopy, diseases of the mind and nervous system, medical jurisprudence, electro-therapeutics, hygiene, dermatology and pharmacy; clinics in medicine, surgery and gynecology. Laboratories are provided for work in anatomy, histology, chemistry, physiology and pathology.

**REQUIREMENTS:** For admission—1) satisfactory evidence of fair English education; 2) good moral character. "Practitioners of medicine of any number of years' experience, who have not previously attended a course of lectures, will, under no circumstances, be matriculated for graduation on a single session's attendance here."

For graduation: 1) twenty-one years of age; 2) three years' study of medicine; 3) two regular courses of lectures; 4) must have dissected the different parts of the body; 5) good moral character; 6) satisfactory examinations.

**FEES:** Matriculation (paid but once), \$5; lectures, \$70; laboratory and incidentals, \$5; dissection, \$10; graduation (returned if candidate is rejected), \$25. No charge for third year when the three years' course is taken.

**STUDENTS:** Number of matriculates and of graduates for the year reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1889-90	34*	5	14.7

### HANNIBAL MEDICAL COLLEGE, OF MEMPHIS, TENNESSEE.

MEMPHIS, Tenn. T. C. COTTRELL, M. D., Secretary and Dean, 73 Madison street.

**ORGANIZED** in 1889 for the education of colored students of both sexes.

The faculty consists of five professors, two white and three colored, of whom three only claim to have degrees of M. D. "Lectures will also be delivered by several prominent physicians and surgeons of the city."

**COURSE OF INSTRUCTION:** The second regular session commenced October 6, 1890, and will continue twenty weeks. A three years' graded course is recommended but not required.

---

\*Not including two graduates who matriculated.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, surgery, obstetrics, gynecology, diseases of children and medical jurisprudence. Dissections during first two years, and laboratory work in chemistry and pharmacy.

**REQUIREMENTS:** For admission—1) good moral character; 2) give evidence of at least a good English education by presenting a diploma from a literary or scientific college, high school or academy, a county or state teacher's certificate, or by passing an examination; 3) eighteen years of age; 4) must believe in a Supreme Being.

For graduation: 1) twenty-one years of age; 2) good moral character; 3) three years' study of medicine; 4) two courses of lectures; 5) satisfactory examination in the required branches; 6) dissected during two courses; 7) thesis.

**FEES:** Matriculation, once only, \$5; tuition, per year, \$25.

**STUDENTS:** Number of matriculates and of graduates at the session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1889-90	4	1	25.

## TEXAS.

### TEXAS MEDICAL COLLEGE AND HOSPITAL.

GALVESTON, Tex. HENRY P. COOKE, M. D., Dean, 169 Market street.

ORGANIZED in 1864.—Re-organized in 1873. Became extinct in 1881 and again re-organized in 1888. Formerly known as the Galveston Medical College.

Faculty consists of eight professors, one clinical professor, one lecturer and a demonstrator.

**COURSE OF INSTRUCTION:** The session of 1890-91 began October 1, 1890, and will continue six months. The method of teaching consists of didactic lectures, recitations, clinical instruction and laboratory work. **Three years' graded course required.\***

Lectures embrace: First year—anatomy, physiology, histology, chemistry, pathology, materia medica. Second year—anatomy, physiology, chemistry, materia medica and therapeutics, pathology, gynecology, theory and practice of medicine, surgery, obstetrics, medical and surgical clinics. Third year—pathology, anatomy, bacteriology, therapeutics, theory and practice of medicine, surgery, obstetrics, diseases of women and children, general clinics, diseases of the eye, ear and throat, and gynecology, diseases of the nerves, obstetrics, materia medica and venereal diseases.

**REQUIREMENTS:** For admission—None.

For graduation: 1) twenty-one years of age and good moral character; 2) three years' study; 3) **three full courses lectures;** 4) two courses of dissection and hospital clinics; 5) satisfactory examination in anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, obstetrics and diseases of women and children, and surgery and pathology.

**FEES:** Matriculation, \$5; lectures, first year, \$70; second year, \$80; third year, \$140; demonstrator, each year, for two years, \$10; graduation, \$20.

**STUDENTS:** Number of matriculates and of graduates reported, and percentage of graduates to matriculates—

Sessions.	Matriculates.	Graduates.	Percent.
1889-90	13	2	15.3

### MEDICAL DEPARTMENT OF THE UNIVERSITY OF SAN ANTONIO.

SAN ANTONIO, Texas.

ORGANIZED in 1888.

No instruction ever given. We have information (December 17, 1890,) that this school has no habitation nor existence except on paper.

---

\* With a qualification.

**UTAH.****MEDICAL INSTITUTION OF MORGAN CITY.**

MORGAN CITY, Utah.

Extinct.

**VERMONT.****VERMONT ACADEMY OF MEDICINE.**

CASTLETON, Vt.

ORGANIZED in 1818. Suspended instruction from 1837 to 1841.—Extinct since 1861. During its existence it graduated 350 students.

**MEDICAL DEPARTMENT OF THE UNIVERSITY OF VERMONT.**

BURLINGTON, Vt. J. H. WOODWARD, M. D., Secretary of the Faculty.

ORGANIZED in 1823. The first class was graduated in 1823. Sessions were held and classes graduated annually, except in 1835, until 1837, when the sessions were suspended. In 1854 the department was re-organized. A class was graduated in 1854, and in each subsequent year.

Faculty consists of seven professors, nine professors of special subjects, a demonstrator and an instructor in chemistry.

**COURSE OF INSTRUCTION:** The regular session begins on the last Thursday in February, and continues twenty weeks. A preliminary course, opening the first Thursday in November, precedes the regular course each year, and continues to the following March. **A three years' course is required** of those who did not matriculate prior to July 1, 1890. Clinics at hospital and dispensary.

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, medical jurisprudence, diseases of the mind and nervous system, ophthalmology and otology, orthopedic surgery, dermatology, diseases of children, venereal diseases, laryngology, microscopy, diseases of the rectum and toxicology.

**REQUIREMENTS:** For admission—None to those who matriculated prior to July, 1890. All other applicants will be required pass an entrance examination in arithmetic, grammar, geography, orthography, American History, English composition and elementary physics before they may be regularly enrolled as students in good standing in this Department. But applicants who may have failed in one or more branches at these examinations, may be enrolled as *conditioned* students; they must make up the deficiency, however, during the first year, before they can be enrolled as students in regular standing.

**Exceptions:**—Such entrance examination will not be required of applicants of the following classes: 1) Those who declare themselves not to be candidates for the degree in medicine from this College. 2) Those who have received the degree of A. B., A. M., B. S., M. S., Ph. B., or Ph. D., from a College or an university duly authorized to confer the same. 3) Those who have successfully completed a full years' course of study in any college or university duly authorized to confer the degrees specified in *section 2*. 4) Those who have passed satisfactorily the entrance examination to the Literary or Scientific Department of the University of Vermont, or to any college or university duly authorized to confer the degree of A. B., A. M., B. S., M. S., Ph. B., or Ph. D. 5) Those who have passed the entrance examination to a medical school having requirements for entrance equivalent to those adopted by this Faculty. 6) Those who have received a "Medical Student's Certificate" from the Regents of the State of New York, or from any similarly constituted authority in other States. 7) Those who have received a diploma or a certificate for any ten studies from the Regents of the State of New York, or from any similarly constituted authority in other States. 8) Those who have satisfactorily completed a three years' course in a High School, Normal School or Academy.

The entrance examinations will be conducted at Burlington, Vermont, by a Board of Examiners appointed by the Medical Faculty. They will be held in November, February and April of each year.

For graduation: Students who matriculated prior to July, 1890, will be subject to the regulations and requirements for graduation as printed in the "Report on Medical Education," 1890. All other candidates for the degree must conform to the following requirements: 1) twenty-one years of age; 2) three years' study; 3) **three full courses of lectures** of twenty weeks each, in different years, and evidence of having pursued the study of practical anatomy; 4) good moral character; 5) satisfactory examination before the faculty and Board of Medical Examiners of the State Medical Society.

**FEES:** Matriculation, \$5; single tickets, \$15; lectures, first and second years, each, \$75; third year, \$50; demonstrator \$10; final examination, \$25; preliminary course, \$35; perpetual ticket, \$150.



STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881	171	50	29+
1882	190	85	44.7
1883	204	68	33.3
1884	230	100	43.3
1885	191	78	40.8
1886	163	52	31.9
1887	185	53	28.6
1888	182	58	31.8
1889	187	59	31.5
1890	206	48	23.3

Percentage of graduates to matriculates for the past ten years, 34.1.

### VERMONT MEDICAL COLLEGE.

WOODSTOCK, Vt.

ORGANIZED in 1872. Extinct in 1856. See previous numbers of this REPORT.

### TRINITY UNIVERSITY, COLLEGE OF MEDICINE AND SURGERY OF THE STATE OF VERMONT.

BENNINGTON, Vt. P. RIPLEY BRADBURY, Dean, 71 Cornhill, Boston, Mass.

INCORPORATED 1889. Fraudulent. An application was made by a Buffalo practitioner for membership in a local association of physicians in that city by presenting a diploma bearing the seal of this university. Suspicion was aroused, and it was soon learned that the institution was nothing more than a "mill," which ground out degrees to order;\* and that there were also departments of dental surgery, law and the liberal arts provided for by this so-called university.

A hardware dealer in Buffalo, who had never spent an hour in the study of medicine, obtained a diploma dated May 27, 1889, from this "College of Medicine and Surgery," receiving the same by express, paying sixty dollars on delivery. The diploma was signed by P. R. Bradbury as dean, and G. Wilmont Averell, LL. D., as president, and sent by Dr. Bradbury from Nashua, N. H. The names of some of the incorporators of this university appear as incorporators of the University of New Hampshire at Nashua, which see.

### VERMONT MEDICAL COLLEGE, OR THE SECOND MEDICAL COLLEGE OF THE AMERICAN HEALTH SOCIETY, FOR SCIENTIFIC AND BENEVOLENT PURPOSES.

RUTLAND, Vt. GEORGE DUTTON, M. D., Dean, 23 Berkeley street, Boston, Mass.†

INCORPORATED 1883.

Faculty consist of two instructors. Its articles declare that the association is for the dissemination of sanitary and medical knowledge and preparation of both sexes for teaching and practicing the art of healing and preservation of health. Dr. Dutton attaches great importance to the study of hygiene, and claims that if people would live up to his teachings no one would be sick. Instruction of all pupils is given at Boston. In the spring of 1889, the class, mostly women who live in and around Boston, went to Rutland, where graduating exercises were held and diplomas granted, and, after remaining there a day, turned to Boston.‡

It is understood that forty-two diplomas have been granted to those now practicing in various sections of the country. Some of the diplomas have been presented to the Board of Censors of the State Medical Society of Vermont, in order to obtain certificates to practice medicine in that State, as required by law. Application for certificates was denied and suit brought to compel recognition of the school. Judge Powers, of Vermont, decided that this college had no authority to grant diplomas, entitling the holders thereof to practice medicine. An appeal was taken to the Supreme Court, in the case of the sister of the Dean, and decision of lower court affirmed.

\*Boston Herald, September 29, 1889.

†Incorporator also of the First Medical College of the American Health Society, Boston, Mass.

‡Why were not the graduating exercises of this class held in Boston, and diplomas of the First Medical College of the American Health Society, Boston, conferred in that city? It is certainly an anomaly to conduct a school in one city and State and to have the graduating exercises and confer the degrees in another State.

## UNION MEDICAL INSTITUTE.

NEWBURY, Vt. W. S. COWAN, Secretary.

ORGANIZED in 1887. An announcement and catalogue was issued for 1889-90. The information concerning this alleged school published in this report for 1890, started an investigation, which resulted in the exposure of the Institute by the Boston *Herald*, Thursday, November 6, 1890. The Manchester (N. H.) *Union*, November 8, 1890, also published the exposure.

The Secretary of this concern, who figures in the "Board of Trustees" as W. S. Cowan, and in the list of professors as 'Watson S. Cowan, M. D., Prof. of Surgery,' graduated in 1889 from the American Eclectic Medical College, Cincinnati, Ohio, whose diplomas are not recognized by the ILLINOIS STATE BOARD OF HEALTH because the school has been found issuing diplomas in an irregular manner. Cowan is in the list of matriculates of this college for 1888-89, as "W. S. Cowan, Ohio," in the list of graduates, 1888-89, as "Watson S. Cowan, Vermont," and his name is in Polk's "Directory" as Watson S. Cowan, a regular physician of Haverhill, N. H. According to the Boston *Herald* he was born at Lowell, Vermont. Hiram A. Cutting, "Ph. D., M. D., Prof. of Microscopical Anatomy," is given in Polk's Directory as living at Lunenburg, Vt., and as a graduate of Dartmouth Medical College in 1870. According to the Boston *Herald* he was at one time State Geologist of Vermont. The name of Charles N. Fox, "Prof. of Theory and Practice of Medicine and Clinical Medicine," is not in Polk's Directory, though the Boston *Herald* locates him at East Corinth, Vt. Basil D. Henderson, "M. D., L.L. B., Prof. of Materia Medica and Toxicology," figures in the announcement of the American Eclectic Medical College, Cincinnati, for 1890-91, as a matriculate in 1890-91, and also as a graduate in 1889-90. He is said to be practicing law in Cummington, Ky. His name is not in Polk's Directory. Edward R. Clark, Professor of Anatomy is in Polk's Directory as a graduate of Dartmouth Medical College in 1885, and as practicing as a "regular" physician at East Arlington, Vt. Augustus C. Fowler, "Ph. D., M. D., Prof. of Physiology," is in Polk's Directory as practicing at Gretna, La., and from whom no reply could be obtained in answer to inquiry regarding graduation. In the list of matriculates of the American Eclectic Medical College for 1888-89, his residence is given as "Louisia," and in the list of graduates of 1889, he figures as having received an *ad eundem* degree, G. B. Hatch, Professor of Obstetrics and Gynecology, has a diploma from the American Eclectic Medical College. His name is in the list of graduates of 1888-89, as "George B. Hatch, Vermont," though he does not figure as a matriculate in any previous year. He is in Polk's Directory as "Hatch, George B., (R.), Med. Coll. of Ohio, 1884, Mem. Vt. State Med. Soc.,"\* His name is not in the lists of graduates or matriculates of the Ohio Medical College since 1880. He is the acknowledged founder of the Union Medical Institute, formulated the plans, drew up the articles, prepared the catalogue and was to be the dean. A few years ago he was in the lumber business in Groton, Vt. J. B. K. Evins, Professor of Chemistry and "Lecture on the Eye and Ear," is in Polk's Directory as J. B. Kepler Evins, Williamstown, Ohio, a graduate of the American Eclectic Medical College in 1889. In the 1889-90 announcement of this college he is in the lists of matriculates and graduates of 1888-89 as J. B. K. Evins, and J. B. Kepler Evins. "C. E. George, L.L. B., Professor of Medical Jurisprudence," says the Boston *Herald*, "has gained some notoriety as a reporter on New England and Canadian papers, but among those who know him his name will not add to the public confidence in the Union Medical Institute." As to S. A. Blodgett, M. D., Demonstrator of Anatomy "and Register," the *Herald* says:

"The most convincing evidence of fraud is in the name of Seth A. Blodgett, M. D., who is a telegraph operator at Woodsville. That he is in no manner entitled to this degree and a graduate of no medical college every one in this vicinity admits. Why and for what reason his name should appear under such a title, and as 'demonstrator' of so important a branch in medicine as anatomy, no one can tell. In the position he occupies—that of a telegraph operator—he is reliable, honest and of good reputation. Why should his name appear in the catalogue? He studied medicine under Dr. G. B. Hatch less than a year. His funds having given out he was obliged to return to telegraphing."

Of the foregoing A. C. Fowler, W. S. Cowan and G. B. Hatch figure in the "Board of Trustees." Horace W. Bailey, president of the board, is a grocer, the town clerk and a newspaper correspondent of Newbury.† The other trustees were Timothy Welch, a farmer at Groton; E. P. Cole, who has not yet been located; J. F. Hatch, Esq., a brother of George B. Hatch; P. A. Merrill, Esq., a grocer of Newburyport, Mass.; W. R. Johnson,† another grocer of Newburyport. H. D. Follansbee,† the chief clerk of P. A. Merrill, and M. E. Hatch, the wife of G. B. Hatch,

The plan of the institution was unfolded to H. W. Bailey in 1883 by G. B. Hatch, who said that the Montebello Sulphur Springs property could be bought at a reasonable price, that it would make "a most excellent place in which to start a medical college," and that a gentleman in the south was interested in the matter and would buy the property if a corporation was chartered under the laws of the State.† Bailey placed his name upon the petition for a charter, which contained the signatures of Timothy Welch, S. L. Eastman, H. W. Bailey, E. P. Cole, J. F. Hatch, W. S. Cowan, P. A. Merrill, W. R. Johnson, G. B. Hatch, M. E. Hatch, H. D. Follansbee. The instrument is dated at the top "Newbury, Vt., June 25, 1883," and below is the record: "State of Vermont, Town Clerk's Office, Newbury. Received for record December 31, A. D. 1887, at 3 o'clock P. M., and recorded. [Attest] Horace W. Bailey, Town Clerk." The act for the charter passed the House of Representatives, but failed in the Senate.

\* Information furnished by himself.

† Disclaims all knowledge of the institution and of the use of his name as trustee.

‡ Disclaims all knowledge of the character of the institution.

"The catalogue bears the imprint, 'Warren Summit Job Print, Warren Summit, N. H.' Although there were three well equipped newspaper offices within a radius of eight miles, the place evidently considered most appropriate for issuing a catalogue of this nature was found nearly 20 miles distant, at Warren Summit, N. H., a station on the Concord & Montreal railroad, of no importance except in the winter when lumbering is carried on, and containing but half a dozen straggling houses. Here an honest boy amateur printer son of the station agent, who is also postmaster and merchant, had a press, and was following in the steps of the great Franklin in this secluded spot at the base of Mt. Moosilauke. Circulars and catalogues of this nature could be issued here without the probability of their authorship being discovered." (*Boston Herald*.)

The catalogue was sent out secretly, and very few of the residents of Newbury had ever heard of the institution until it was exposed, nor had the neighboring practitioners heard of it.

The surreptitious manner in which the circulars and catalogues were distributed is strong evidence of fraud. A trustee admits that it was not the intention to circulate them about Newbury, but west and at a distance, with the intention of bringing a large class together and then open a college building. Home patronage is usually catered to in most all new enterprises, but here is one where few of the town residents even knew of the affair, and to many this exposure will be a reminder of the adroitness, scheming and shrewd calculation which has characterized the whole affair.

A postmaster of a neighboring town when interrogated as to whether mail matter was sent by Dr. G. B. Hatch, remarked: "There was some; might have been 25 letters in all; might have been more than that or less than that."

"As soon as the catalogues (300 in number) were issued, about a dozen were sent to Dr. Hiram A. Cutting, professor of microscopical chemistry, who is known to have circulated a portion of them. It would be no difficult matter to prove that several catalogues have been sent through the mails.

"It is the general opinion that diplomas are being sold in the West, and one prominent business man made the statement: 'It is susceptible of proof that two diplomas have been sold for \$50 apiece.' This rumor came from a direct source and can be verified in every particular."—(*Boston Herald*.)\*

The correspondent of the *Manchester Union* was informed "by a reputable citizen of Haverhill, N. H., that he had seen one of the printed diploma blanks, notwithstanding the report that there were none in existence."

C. E. Caswell, the boy printer at Warren Summit, said that the catalogue was printed in the spring of 1889, and was delivered June 1. He thought it was all right, but he was not acquainted with the parties. "Hatch had been corresponding with me for six months. He first asked the price for printing 1000 catalogues, and, after much talk, agreed on 300, for which he was to pay \$7." Caswell's word is substantiated by his parents. Caswell said, when asked what Hatch said: "He told me I had better not say anything, but keep it quiet."

The catalogue says: "Newbury Private Hospital will be open to the students of this college." There is not and never was such a hospital of any description. It also states that all the examinations for the graduation are held in the college building, are conducted in writing and take place at commencement. The people of Newbury know of no such place as the college building.

Attention was first called to this bogus concern by the ILLINOIS STATE BOARD OF HEALTH.

## VIRGINIA.

### MEDICAL EXAMINING BOARD OF VIRGINIA.

FARMVILLE, Va. PAULUS A. IRVING, M. D., Secretary.

ORGANIZED November 15, 1884. The law first became operative January 1, 1885.

**COMPOSITION OF THE BOARD:** The Board consists of three physicians from each Congressional district in the State, and two from the State at large, making thirty-two members, and in addition, also five homeopathic physicians. Members of the Board, except homeopaths, are nominated by the State Medical Society and appointed by the Governor every four years.

**PERSONS REQUIRED TO BE EXAMINED:** Every applicant for the practice of medicine in Virginia, who has not been assessed with a license tax as a physician or surgeon in this State at some time prior to January 1, 1885, is required to pass a satisfactory examination before he can commence practice. Graduates and non-graduates are subject to the same examination.

**APPLICATION FOR EXAMINATION:** Any person wishing to be examined with the view of practicing medicine in Virginia, is required to fill out and file with the Secretary of the Board, a form of application stating: 1) age; 2) residence; 3) college where graduated (if graduated), and date of graduation. The application must be accompanied by recommendations from two citizens of the county in which the applicant resides, and a fee of five dollars.

\*The BOARD has no evidence that any of these diplomas have been offered for registration.

**MODE OF CONDUCTING EXAMINATION:** Examinations are held by the Board in session regularly twice each year. During the recess of the Board, if any person has been prevented by sickness or other good cause, the President may order three members of the Board to examine him. The cause is discretionary with the President. The PLAN of EXAMINATION is as follows:

1. Examination questions and answers are to be in writing or printing.
  2. The applicant is required to answer at least three-fourths (75%) of the questions satisfactorily, and show a fair general knowledge of all the branches upon which he is examined. The time allotted in which to make answers in each section is three hours.
  3. Applicants can neither give nor receive information relating to the subjects under consideration during the examination.
  4. No examiner is permitted to tell the applicant the result of his examination until after the examinations are all over and have been passed upon by the Board.
- The examinations are in: 1) chemistry; 2) anatomy; 3) physiology; 4) hygiene; 5) medical jurisprudence; 6) materia medica and therapeutics; 7) obstetrics; 8) gynecology; 9) practice of medicine; 10) surgery.

The examiners report the result to the President of the Board, who issues the license or notifies the candidate of his rejection, as the case may be.

The Virginia laws require that no person shall be rejected on account of his adherence to any particular school of medicine or system of practice.

Number of applicants examined from January 1, 1885,—when the law went into effect—to September 5, 1889, 383. Of this number 93 were rejected and 12 withdrew without completing the examination; 290 hold certificates from the Board, all but 10 being graduates of colleges in good standing. Of the 93 rejected, all but 14 were graduates. Twenty-eight non-graduates were applicants, of whom ten passed.

The following table shows the number of applicants from various medical colleges who have appeared before the Board, the number passing, the number rejected, etc.:

---

\* With the Virginia Board.

INSTITUTIONS REPRESENTED BY THE APPLICANTS  
BEFORE THE  
MEDICAL EXAMINING BOARD OF VIRGINIA,

FROM THE ORGANIZATION OF THE BOARD,  
January 1, 1885, to September 5, 1890.

	Total number of applicants for examination from each institution.....	Total number awarded certificate on first examination....	Total number rejected on examination.....	Rejected applicants appearing for examination second time.....	Rejected applicants appearing for examination second time.....	Rejected second time.....	Rejected applicants appearing for examination third time.....	Rejected third time.....	Incomplete examinations, withdrawals or otherwise....
Medical College of Virginia.....	73	59	11	5	4	1	.....	.....	3
University of Virginia—Medical Department.....	50	49	1	.....	.....	.....	.....	.....	.....
College of Physicians and Surgeons, Baltimore, Maryland.....	47	31	14	6	4	2	.....	.....	2
University of Maryland—Medical Department, Baltimore.....	53	34	19	4	2	2	1	1	.....
Washington University, Baltimore, (Extinct).....	1	.....	.....	.....	.....	.....	.....	.....	1
Baltimore Medical College, Maryland.....	3	.....	2	.....	.....	.....	.....	.....	1
Baltimore University—School of Medicine.....	3	.....	3	1	.....	1	.....	.....	.....
Jefferson Medical College, Philadelphia, Penn.....	23	15	8	2	2	.....	.....	.....	.....
University of Pennsylvania, Medical Department, Philadelphia.....	4	4	.....	.....	.....	.....	.....	.....	.....
Medico-Chirurgical College, Philadelphia.....	1	.....	1	1	.....	1	1	1	.....
Woman's Medical College of Pennsylvania, Philadelphia.....	1	1	.....	.....	.....	.....	.....	.....	.....
Hahnemann Medical College and Hospital, Philadelphia.....	2	2	.....	.....	.....	.....	.....	.....	.....
Bellevue Hospital Medical College, New York.....	8	7	1	1	1	.....	.....	.....	.....
University of the City of New York—Medical Department.....	14	10	4	1	.....	1	.....	.....	.....
College of Physicians and Surgeons, New York.....	6	6	.....	.....	.....	.....	.....	.....	.....
Geneva Medical College, New York.....	1	1	.....	.....	.....	.....	.....	.....	.....
National Medical College, Washington, D. C.....	1	.....	1	.....	.....	.....	.....	.....	.....
University of Georgetown, D. C., Medical Department.....	2	1	1	.....	.....	.....	.....	.....	.....
Howard University—Medical Department, Washington, D. C.....	15	2	13	4	.....	4	.....	.....	.....
Louisville Medical College, Kentucky.....	5	1	4	.....	.....	.....	.....	.....	.....
Hospital College of Medicine, Louisville, Ky.....	4	3	1	.....	.....	.....	.....	.....	.....
Kentucky School of Medicine, Louisville.....	2	2	.....	.....	.....	.....	.....	.....	.....
University of Louisville—Medical Department.....	2	1	1	.....	.....	.....	.....	.....	.....
University of Tennessee—Medical Department, Nashville.....	1	1	.....	.....	.....	.....	.....	.....	.....
Vanderbilt University—Medical Department, Nashville, Tenn.....	3	2	1	1	1	.....	.....	.....	.....
Detroit Medical College, Michigan.....	2	1	1	.....	.....	.....	.....	.....	.....
University of Michigan—Medical Department, Ann Arbor.....	2	2	.....	.....	.....	.....	.....	.....	.....
St. Louis Medical College, Missouri.....	1	1	.....	.....	.....	.....	.....	.....	.....
Columbus Medical College, Ohio.....	3	1	2	1	1	.....	.....	.....	.....
Cincinnati Medical College, Ohio.....	1	.....	1	.....	.....	.....	.....	.....	.....
Homoeopathic Hospital Medical College, Cleveland, Ohio.....	2	2	.....	.....	.....	.....	.....	.....	.....
Leonard Medical College, Raleigh, N. C. (colored).....	5	3	2	.....	.....	.....	.....	.....	.....
Norfolk College of the State of South Carolina, Charleston.....	1	.....	1	1	1	.....	.....	.....	.....
University of Vermont, Burlington.....	1	1	.....	.....	.....	.....	.....	.....	.....
Heidelberg University, Germany.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Southern Medical College, Atlanta, Georgia.....	1	.....	1	.....	.....	.....	.....	.....	.....
Atlanta Medical College, Atlanta, Ga.....	1	.....	1	.....	.....	.....	.....	.....	.....
Chicago Homoeopathic Medical College, Chicago.....	1	1	.....	.....	.....	.....	.....	.....	.....
? King's George Hospital, London, England.....	1	1	.....	.....	.....	.....	.....	.....	.....
? King's George Hospital, London, England*.....	1	.....	1	.....	.....	.....	.....	.....	.....
King's College, London, England.....	1	.....	1	.....	.....	.....	.....	.....	.....
Colleges unknown, (Record not sent by Examiners).....	5	4	.....	.....	.....	.....	.....	.....	1
Non-graduates.....	28	10	14	1	.....	1	.....	.....	4
Totals.....	383	260	111	30	17	13	2	2	12

\* No such institution in existence.

## UNIVERSITY OF VIRGINIA, MEDICAL DEPARTMENT.

CHARLOTTESVILLE, Albermarle County. Professor WILLIAM M. THORNTON, Chairman of the Faculty of the University.

ORGANIZED in 1825. The first class graduated in July, 1828. There was no graduating class in 1862.

The faculty consists of three professors, one adjunct professor, a demonstrator of anatomy, an assistant demonstrator and two instructors.

COURSE OF INSTRUCTION: One annual graduating session of nine months' duration. The session of 1890-91 began October 1, 1890, and will close July 2, 1891. Daily examinations on the subjects of preceding lectures. Course is graded, extending over two years.

Lectures embrace anatomy, physiology, chemistry, materia medica, theory and practice of medicine, obstetrics, medical jurisprudence, surgery and pharmacy, microscopy, biology, physics, comparative anatomy and clinics.

"The arrangement of the lectures is such that the student acquires a competent knowledge of anatomy, physiology and chemistry before he enters upon the study of the principles and practice of medicine and surgery.

REQUIREMENTS: For admission the faculty is required by law to be satisfied by actual examination or by certificate, that applicants are sufficiently proficient to avail themselves of the advantages afforded by the University.

For graduation: "Graduation in medicine, as in the other departments and schools the University of Virginia, does not depend upon the time which has been spent in the study of medicine, but upon the preparation of the student, as indicated by rigid examinations, which he is called upon to stand. Hence it is possible for a diligent student to graduate in one session. But the severe and protracted labor necessary for this purpose is attended with evils of which the medical faculty is fully conscious, and it is considered far better for a student to attend lectures for two sessions, giving his attention during the first session to the subjects of chemistry, anatomy and physiology especially, and endeavoring to obtain only such a general knowledge of the other branches, as will better enable him to complete the course and to profit by the instruction of the second year."

FEES: Matriculation and use of library, \$25; tuition, \$10; graduation, \$15; infirmary fee, \$7; preparatory courses, \$40 and \$90.

STUDENTS: Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1880-81	57	13	22.8
1881-82	34	12	32.3
1882-83	56	16	28.6
1883-84	41	17	41.4
1884-85	42	15	35.7
1885-86	62	17	27.4
1886-87	54	16	29.6
1887-88	82	23	28.1
1888-89	98	25	25.5
1889-90	113	19	16.8

Percentage of graduates to matriculates for the past ten years, 27.

## WINCHESTER MEDICAL COLLEGE.

WINCHESTER, Va.

CHARTERED by the Legislature of Virginia in 1826. The school was organized by Dr. Cook, a celebrated physician of Virginia at the time. It continued in operation but a few years, when it became extinct. In 1850 it was revived by Dr. Hugh McGuire, and was operated with moderate success until the buildings were burned during the war. During its latter career it had an attendance of from 25 to 30 students annually, and up to 1857 had graduated 47.

## MEDICAL DEPARTMENT OF RANDOLPH MACON COLLEGE.

Prince Edward Court House, Va.

ORGANIZED as a private medical school by Dr. John P. Mettauer, presumably about 1840-45. In 1849 it became the Medical Department of Randolph Macon College, located then at Clarksville, afterward at Ashland, Va. Extinct, 1855.

## MEDICAL COLLEGE OF VIRGINIA.

RICHMOND, Va. J. S. DORSEY CULLEN, M. D., Dean.

ORGANIZED in 1838 as the Medical Department of Hampden Sidney College, under which name it continued until 1851, when a new charter was obtained and the present name assumed. The first class was graduated in 1840. Classes have been graduated each subsequent year. The faculty consists of eight professors, nine adjunct professors, one lecturer and two demonstrators.

COURSE OF INSTRUCTION: One annual course of six months' duration. The fifty-third annual session began October 1, 1890, and will continue six months. Daily examinations by each professor or assistant. Clinics at hospital. "The instruction consists of didactic lectures with demonstrations, clinical teaching, recitations, examinations and practical teaching in subjects involving manipulation."

Lectures embrace anatomy, physiology, chemistry, materia medica and therapeutics, theory and practice of medicine, pathology, surgery, obstetrics and gynecology, hygiene, diseases of children and diseases of the ear, eye and throat.

**REQUIREMENTS:** For admission—"No student applying for matriculation will be admitted, if, in the opinion of the faculty, his preliminary education is insufficient to justify his entering on the study of medicine."

For graduation—1) three-years' study of medicine, or its equivalent; 2) two full courses of lectures; 3) dissections of all parts of a subject; 4) satisfactory examination upon all subjects taught in the college; 5) good moral character.

**FEES:** Matriculation, lectures and demonstrator, \$90; examination for degree, \$30.

**STUDENTS:** Number of matriculates and of graduates at each session reported, and percentage of graduates to matriculates—

Session.	Matriculates.	Graduates.	Percent.
1881-82	—	13	—
1882-83	61*	9	14.7
1883-84	91*	33†	36.2
1884-85	66	19	28.8
1885-86	72	17	23.6
1886-87	72	15	20.8
1887-88	46	15	32.6
1888-89	42	13	30.9
1889-90	60	10	16.6

Percentage of graduates to matriculates for past six years, 24.8.

## WASHINGTON.

**AN ACT TO REGULATE THE PRACTICE OF MEDICINE AND SURGERY IN THE STATE OF WASHINGTON, AND TO LICENSE PHYSICIANS AND SURGEONS; TO PUNISH ALL PERSONS VIOLATING THE PROVISIONS OF THIS ACT, AND TO REPEAL ALL LAWS IN CONFLICT THEREWITH, AND DECLARING AN EMERGENCY.**

*Be it enacted by the Legislature of the State of Washington:*

**SECTION 1.** The governor of this State shall appoint a board of examiners to be known as the State Medical Examining Board, consisting of nine members, who shall be learned and skilled in the practice and theory of medicine and surgery, and who shall hold their office for three (3) years and until their successors are appointed and qualified: *Provided*, That the members thereof first appointed under this act, shall be divided into three (3) classes, each class to consist of three (3). The first class shall hold office under said appointment for the period of one (1) year; the second class for two (2) years, and the third class for three (3) years from the date of their appointment: *It is further provided*, That no member thereof shall be appointed to serve for more than two terms in succession.

**SEC. 2.** The members of said Medical Examining Board shall, before entering upon their duties as such members, take and subscribe an oath to support the constitution and laws of the State of Washington, and of the United States, and to well and faithfully and without partiality perform the duties of such office according to the best of their knowledge and ability; which oaths shall be filed and preserved of record in the office of the secretary of said board. Said Medical Examining Board shall elect a president, secretary and treasurer, and shall have a common seal. The president and secretary shall have the power to administer oaths; said Medical Examining Board shall hold meetings for examination on the first Tuesday of January and July of each year; said meetings shall be held alternately in Western and Eastern Washington at such places as the Board may designate: *Provided*, That the first meeting be held at Olympia within thirty (30) days after the appointment and qualification of said Board: *And provided*, That the Board may call special meetings when in the opinion of a majority of said Board such special meetings are necessary: said Board shall keep a record of all the proceedings thereof, and also a record or register of all applicants for a license, together with his or her age, the time such applicants shall have spent in the study and practice of medicine and surgery, if they shall have so practiced at all, and the name and location of all institutions granting to such applicants degrees, or certificates of lectures in medicine or surgery. Such record or register shall also show whether such applicant was rejected or licensed under this act. Said books and register shall be *prima facie* evidence of all matters therein recorded.

**SEC. 3.** Hereafter every person desiring to commence the practice of medicine and surgery, or either of them, in any of their or its branches in this State, shall make a written application to said Board for a license so to do, which application shall be supported and accompanied by an affidavit of such applicant, setting forth the actual time spent by the applicant in the study of medicine and surgery, and when; whether such study was in an institution of learning, and if so, the name and location thereof, and if not in an institution, where and under whose tutelage such study was prosecuted; the time said applicant shall have been engaged in the actual practice, if at all, of medicine and surgery, or either of them, and where the applicant was located during the time of such practice, and the age of the applicant at the time of making such application; such application and affidavit to be filed and preserved of record in the office of the secretary of said Board. Such applicant, at the time and place designated by said Board, or at the regular meeting of said Board, shall submit to an examination in the following branches, to wit: anatomy, physiology, chemistry, histology, materia medica, therapeutics, preventive medicine, practice of medicine, surgery, obstetrics, diseases of women and children, diseases of the nervous system, diseases of the eye and ear, medical jurisprudence, and such other branches as the Board shall deem advisable. Said Board shall cause such examination to be both scientific and practical, and of sufficient severity to test the candidate's fitness to practice medicine and surgery; which examination shall be by written or printed, or partly written and partly printed, questions and answers, and the same shall be filed and preserved of record in the office of the secretary of said Board. After examination, if the same be satisfactory, said

\* Includes pharmacy students.

† Includes one pharmacy graduate.

Board shall grant a license to such applicant to practice medicine and surgery in the State of Washington; which said license can only be granted by the consent of not less than five members of said Board, except as hereinafter provided, and which said license shall be signed by the president and secretary of said Board and attested by the seal thereof. The fee for such examination shall be ten (\$10) dollars, and shall be paid by the applicant to the treasurer of said board toward defraying the expenses thereof, and such Board may refuse or revoke a license for unprofessional or dishonorable conduct, subject, however, to the right of such applicant to appeal from the decision of said Board refusing or revoking such license, as hereinafter provided.

Sec. 4. The words "unprofessional or dishonorable conduct," as used in section three (3) of this act, are hereby declared to mean—

First. The procuring or aiding or abetting in procuring a criminal abortion.

Second. The employing of what are popularly known as "cappers" or "steerers."

Third. The obtaining of any fee on the assurance that a manifestly incurable disease can be permanently cured.

Fourth. The wilfully betraying of a professional secret.

Fifth. All advertising of medical business in which untruthful and improbable statements are made.

Sixth. All advertising of any medicines or of any means whereby the monthly periods of women can be regulated, or the menses re-established if suppressed.

Seventh. Conviction of any offense involving moral turpitude.

Eight. Habitual intemperance.

Sec. 5. In any case of the refusal or revocation of a license by said Board under the provisions of this act, said Board shall file a brief and concise statement of the grounds and reasons for such refusal or revocation, in the office of the secretary of said Board, which said statement, together with the decision of said Board in writing, shall remain of record in said office. Before a license can be revoked by said Board for unprofessional or dishonorable conduct under the provisions of this act, a complaint of some person under oath must be filed in the office of the secretary of said Board, charging the acts of unprofessional or dishonorable conduct and facts complained of against the licensee accused, in ordinary and concise language, and thereupon said Board shall cause to be served upon such accused licensee a written notice and copy of such complaint, which said notice shall contain a statement of the time and place of hearing of the matter and things set forth and charged in such complaint, and said notice shall be so served at least ten days prior to the time of such hearing. Such accused licensee may appear at such hearing and defend against the accusation of such complaint personally, and by counsel, and may have the sworn testimony of witnesses taken and present other evidence in his behalf at such hearing, and said Board may receive the arguments of counsel at such hearing.

Sec. 6. In any case of the refusal or revocation of a license by said Board under the provisions of this act, the applicant whose application shall be so refused, and the licensee whose license shall be so revoked by said Board, shall have the right to appeal from the decision so refusing or revoking such license within thirty days after the filing of such decision in the office of the secretary of said Board as hereinbefore in this act provided. Such appeal shall be to the superior court, in and for the county in which was held the last general meeting of said Board prior to the refusal of such license, in the case of such refusal; and to the superior court in and for the county in which the hearing was had upon which such license was revoked in case of such revocation. In any case a person desiring to take such appeal, shall serve, or cause to be served, upon the secretary of said Board, a written notice of such appeal, which shall contain a statement of the grounds of such appeal, and shall file in the office of such secretary an appeal bond with good and sufficient surety, to be approved by said secretary, to the State of Washington, conditioned for the speedy prosecution of such appeal, and the payment of such costs as may be adjudged against him upon such appeal. Said secretary shall, within ten (10) days after the service of said notice of appeal, and the filing and approval of said appeal bond, transmit to the clerk of the superior court to which such appeal is taken, a certified copy under the seal of said Board, of the decision of said Board, and the grounds thereof in the case of the refusal of a license; and in addition thereto, a certified copy, under such seal, of the complaint in the case of the revocation of a license, together with the bond and notice of appeal. The clerk of such court shall thereupon docket such appeal causes and they shall stand for trial in all respects as ordinary civil actions, and like proceedings be had thereon. Upon such appeal said cause shall be tried *de novo*. Either party may appeal from the judgment of said superior court to the supreme court of the state in like manner as in civil actions, within sixty (60) days after the rendition and entry of such judgment in said superior court. If such judgment shall be in favor of the party appealing from the decision of said Board, and in case said examining Board does not appeal from said judgment within sixty (60) days, then and in that case, said Board shall, at the end of said sixty (60) days and immediately upon the expiration thereof, issue to such successful party the usual license to practice medicine and surgery in this state, and in addition thereto shall reinstate upon the records of said Board the name of such successful applicant in case of the revocation of his license by such Board. In case of such appeal to the supreme court by said Board, no such license shall be issued or reinstatement be required until the final determination of said cause, and as hereinafter provided. In case the final decision of the supreme court be against said Medical Examining Board, then and in that case said court shall make such order in the premises as may be necessary, and said Board shall act accordingly: *Provided*, That in no case shall an appeal bond be required of said Board, nor shall any costs be adjudged or taxed against the same.

Sec. 7. The person receiving said license shall file the same, or a copy thereof, with the county clerk in and for the county where he or she resides, and said county clerk shall file said certificate or copy thereof, and enter a memorandum thereof, giving the date of said license and name of the person to whom the same is issued, and the date of such filing, in a book to be provided and kept for that purpose; and said county clerk shall each year furnish to the secretary of said Board a list of all certificates on file in his office, and upon



notice to him of the change of location or death of a person so licensed, or of the revocation of the license granted to such person, said county clerk shall enter at the appropriate place in the record so kept by him, a memorandum of said fact, so that the records kept by said county clerk shall correspond with the records of the Board as kept by the secretary thereof. In case a person so licensed shall move into another county of this state, he or she shall procure from the county clerk a certified copy of said license and file the same with the county clerk in the county to which he or she shall remove. Said county clerk shall file and enter the same with like effect as if the same was the original license.

SEC. 8. Any person practicing medicine or surgery within this State without first having obtained the license herein provided for, or contrary to the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than fifty (\$50) dollars nor more than one hundred (\$100) dollars, or by imprisonment in the county jail not less than ten or more than ninety days, or by both such fine and imprisonment. All such fines shall be paid into the State Treasury, for the use and benefit of the common schools. Any person shall be regarded as practicing within the meaning of this act who shall append the letters "M. D." or "M. B." to his or her name, or for a fee prescribe, direct or recommend for the use of any person, any drug or medicine, or agency for the treatment, care or relief of any wound, fracture or bodily injury, infirmity or disease: *Provided, however,* The act shall not apply to dentists. Justices of the peace and the respective municipal courts shall have jurisdiction of violations of the provisions of this act. It shall be the duty of the respective county or district attorneys to prosecute all violations of this act. In cases of appeals to the superior court as hereinbefore provided, it shall be the duty of the district attorney of the county wherein such appeal shall be tried, to represent said Board upon said appeal. And in all cases of appeal to the Supreme Court under the provisions of this act the Attorney General shall represent said Board upon such appeal.

SEC. 9. Said Board shall have authority to prescribe and establish all needful rules and regulations to carry into effect the provisions of this act.

SEC. 10. Section 2,289 of the General Laws of Washington Territory of 1881, and section 1, to amend section 2,289 of the Code of Washington Territory, are hereby repealed. It is, however, provided that all persons licensed under said act, or having complied with the provisions thereof, shall be taken and considered as licensed under this act, and the secretary of the board herein provided for shall enter the names of such persons upon the register so kept by him as licensed physicians and surgeons, upon the written application of of such persons.

SEC. 11. Whereas, great embarrassment and inconvenience in relation to the practice of medicine and surgery in this State will arise from delay of time when this act shall take effect, it is therefore declared that an emergency exists, and this act shall take effect and be in force in thirty days from and after the date of approval by the Governor.

Received by the Governor March 28, 1890.

[*Note by the Secretary of State.*—The foregoing act having been presented to the Governor of the State for his approval, and not having been filed in the office of the Secretary of State within the time prescribed by the constitution of the State, with his objections thereto, has become a law under the provisions of the constitution.]

## STATE MEDICAL EXAMINING BOARD OF WASHINGTON.

WALLA WALLA, Wash. HOWARD R. KEYLOR, M. D., Secretary.

ORGANIZED in 1890, in accordance with the foregoing act.

## WASHINGTON BIOCHEMIC COLLEGE.

NORTH YAKIMA, WASHINGTON.

INCORPORATED, May 22, 1889. The faculty embraces five professors, none in surgery or obstetrics, who prepare students as specialists only in biochemistry, (chemistry of life, Schusslers therapeutics.) Four of the five professors received their diplomas from this college. No lectures have ever been given. One of the professors, Dr. Geo. W. Carey, has opened a branch college at Spokane Falls. He advertises in a circular as "Teacher of Biochemistry and Pathology in charge of the Branch of the Washington Biochemic College. Office, rooms 125-126 Tull Block, Spokane Falls." We are informed that the college consists of Dr. Carey's office, and that while Carey teaches at the "Branch" he does not grant diplomas. These are to be had only at the main office at North Yakima, where they have been granted (?) to some eight or twelve persons.

**Diplomas not recognized.**

## UNIVERSITY OF SPOKANE FALLS, COLLEGE OF MEDICINE.

SPOKANE FALLS, Wash. GEO. W. LIBBY, M. D., Dean.

ORGANIZED IN 1890.

The faculty consists of thirteen professors.

**COURSE OF INSTRUCTION:** A preliminary course of lectures, quizzes and recitations will begin March 11, 1891, and end June 11, 1891. The first regular course will begin October 1, 1891, and will continue six months. **Three years graded course required.**

Lectures embrace anatomy, physiology, chemistry, toxicology, materia medica and therapeutics, theory and practice of medicine, principles and practice of surgery and clinical surgery, obstetrics, gynecology, diseases of the throat and chest, diseases of children, dermatology, orthopedic surgery, genito-urinary diseases, diseases of the eye and ear, and mental and nervous diseases. Medical and surgical clinics at the Sister's Hospital (100 beds), and clinical work at the college dispensary.

**REQUIREMENTS:** For admission—1) "No reading or studying of medicine required before entering college"; 2) each candidate for admission must present (a) a credible certificate of good moral character, (b) diploma of graduation from a good scientific and literary college or high school, or a satisfactory county or state teacher's certificate. Lacking this, he will be required to pass an examination in the branches of a good English education before a member of the faculty appointed for the purpose.

For graduation: 1) good moral character; 2) twenty-one years of age; 3) attendance upon **three full courses of medical lectures**, no two of which shall be in the same year, and the last of which shall be in this college; 4) two full courses of hospital, college and dispensary clinical instruction; 5) satisfactory examinations; 6) satisfactory conduct during the college term; 7) close attendance upon the lectures.

**FEES:** Matriculation (payable but once), \$5; general ticket, \$120; dissection, \$10; graduation fee, \$30.

## WEST VIRGINIA.

## STATE BOARD OF HEALTH.

MARTINSBURG, W. Va. N. D. BAKER, M. D., Secretary.

The State Board of Health of West Virginia, was organized June 21, 1881, in accordance with an Act of the Legislature, passed March 8, 1880. As the Board, in addition to looking after the public health, was also intrusted with the regulation of the practice of medicine, one of its first duties was to see that certificates were issued to all persons entitled to receive them. The law recognized three classes of practitioners of medicine, first the graduates of reputable medical colleges, who were granted certificates upon the presentation of their diplomas; second, all persons who had been engaged in the continuous practice of medicine, in the State, ten years prior to March, 1881, were given certificates, upon the proper evidence; third, those who should pass a successful examination before the State Board of Health in session, or the two members of any congressional district.

"As fully one-fourth of the physicians of the State were not graduates, the number of examinations in the first year or two was very large, requiring of the members of the Board a liberal allowance of time and labor. In these examinations, we have tried to gradually raise the standard. We now require the same proficiency and a higher percentage than is required by the best colleges. In carrying the law into effect, the Board met with considerable resistance in some instances, in others attempts were made to obtain certificates by fraud. In one notable case, where a certificate was gotten by fraud, the Board cancelled the certificate and notified the proper authorities not to allow the party to practice medicine in the county of his residence; this, of course, took us into the courts, the case passing through our circuit court, our State court of appeals and finally through the Supreme Court of the United States, each court in turn sustaining the position of the State Board of Health, and the constitutionality of our State law regulating the practice of medicine. (The decision of the Supreme Court will appear in full in the next volume of Transactions of the Board.)

"The legislature of 1888, at the instance of the Board of Health, repealed the law requiring the Board to give certificates to persons who had been practicing ten years prior to 1881, thereby saving the Board a great deal of annoyance, and cutting off all those who had not up to the time, taken advantage of the Act.

"The number of certificates issued to graduates is 1,069; to persons who had practiced ten years prior to 1881, known as ten-year-olds, 461; and to those examined by the Board, 169. Of the latter all except 32 were examined and passed prior to 1884. Each year since 1884 the number passed by the Board has grown less. The Secretary records only those who were successful in their examinations. Most of these examinations are made by the members of the Board in the different congressional districts, and the Secretary acquires a knowledge of them by being called upon to record the certificates."

**After July, 1891, this Board will require four years' study and three courses of lectures for license.**

"The attention of the Board has been directed to the formation of efficient local boards of health throughout the State. This has proved to be a much more difficult task than would at first appear, but through the persistent efforts of the Board, there is an active and efficient local Board of Health in each county, working in hearty accord with the State Board of Health. The Board endeavors to work through our local Boards of Health, giving them every assistance and encouragement in our power. When the necessity for local quarantine arises, we insist upon the local boards' acting promptly, giving them the moral support of all the power vested in the State Board by the law. In this way we may not figure quite so prominently, but we find this method for the best interests of the people. We have our videttes always on the ground, no matter in what quarter the enemy may strike, we are ready to meet the attack.

"We keep constantly on hand circulars on the prevention of typhoid fever, measles, scarlet fever, diphtheria, etc., which are supplied to local health officers, and by them distributed to the people, during the prevalence of any of the above diseases; in this way we are sure of a hearing, as persons with their fears aroused will read our circulars who at any other time would cast them aside.

"It has been our unpleasant duty on several occasions to have to discipline colleges for violation of their published schedule of requirements for graduation, in the cases of West Virginia students. The first case was that of an Ohio medical college, in which we were sustained not only by the profession of our own state, but by other state boards of health, medical colleges, and the profession generally. In subsequent cases we have had but very little trouble, as colleges that have placed themselves under the ban are only too glad to have the matter rectified, and are willing to do almost anything when caught. As the guardians of the public health, we are frequently called upon to investigate the cause of epidemics in different parts of the state.

"We are at this time making a special effort to prevent the pollution of our running streams by sewage, etc., and at the same time to call to the attention of the public the great danger necessarily connected with such pollution. The people once aroused, the application of the remedy will be easy. A case in point is that of our Asylum for the Insane, from which 300,000 gallons of sewage are daily thrown into the West Fork River, which stream, twenty miles below, becomes the source of water supply for the flourishing town of Clarksburg. Our investigation and report to the legislature satisfied them that there was danger to the public health in the present arrangement for the disposal of the sewage of the asylum; they therefore promptly made the necessary appropriation for the correction of the evil.

"The legislature of 1886 passed an act making it the duty of the State Board of Health to collect vital statistics. In this we have been but partially successful; each new innovation requires time for its perfecting, and this new labor imposed upon the Board has been no exception to the rule. In our state the clerks of county courts receive the reports of births and deaths from the physicians and send, at the end of the year, a tabulated statement to the secretary of the State Board of Health. We have considerable trouble getting the clerks to perform the work correctly."

## WEST VIRGINIA UNIVERSITY.

### MEDICAL DEPARTMENT (School of Biology).

MORGANTOWN, W. VA. JAMES W. HARTIGAN, A. M., M. D., PROFESSOR OF BIOLOGY.

Instruction is given in zoology, botany, human anatomy, physiology, hygiene.

## WISCONSIN.

### MILWAUKEE COLLEGE OF PHYSICIANS AND SURGEONS.

MILWAUKEE, WIS.

INCORPORATED in 1881. Fraudulent. Known also as the "Coney Medical Institute." Expended by the ILLINOIS STATE BOARD OF HEALTH in June, 1883. Charter annulled in October, 1883.

## UNIVERSITY OF WISCONSIN.

### SPECIAL SCIENCE COURSE, ANTECEDENT TO MEDICINE.

MADISON, WIS. CHARLES REID BARNES, Esq., Secretary.

The faculty of the Special Science course consists of fifteen professors and seven instructors.

"In response to a request from the Wisconsin State Medical Society, the University offers the following special course in science, arranged for those contemplating the study of medicine and surgery. It is intended to give a broad and solid foundation for the professional medical course, together with collegiate culture.

"The Chicago College of Physicians and Surgeons, Rush Medical College and the Chicago Medical College have approved the course and will accept it as the equivalent of one year's study, thus enabling those who have taken the four years' course here to complete their medical course in these excellent colleges in two years.

"All the studies given cannot be taken in the time allotted. Three full studies are required during each term, which may be chosen from those given. If the degree of Bachelor of Science is sought the *required* studies of the general science course must be taken.

**REQUIREMENTS:** For admission—English grammar, including sentential analysis and orthography, political and physical geography, arithmetic, algebra through quadratics, plane and solid (including spherical) geometry, history of the United States, natural philosophy, physiology, botany, German grammar, and twenty lessons in any standard reader. The requirements will be higher for 1892.

"From the branches offered, special students may select a two years' course embracing the larger portion of those subjects which bear directly upon the studies of medicine and surgery. A more liberal course, however, is recommended, which shall embrace not only all of these sciences, but cognate branches and a due measure of language and of mental science, substantially as outlined in the following course:"

**Freshman Year:** Fall term—Morphology of plants, pharmaceutical botany, German or French and algebra. Winter term—Pharmaceutical botany, general zoology, theory of equations and German or French. Spring term—Botany (morphology of flowering plants, lectures, laboratory work and collection, general zoology, trigonometry and German or French.

**Sophomore Year:** Fall term—Vertebrate anatomy, descriptive inorganic chemistry, general morphology of plants, mechanics and German or French. Winter term—Vertebrate anatomy, qualitative chemical analysis, general vegetable morphology and vegetable histology, physics and German or French. Spring term—Animal embryology, qualitative chemical analysis, general vegetable morphology and vegetable histology, physics and German or French.

**Junior Year:** Fall term—Vegetable embryology and physiology, human physiology, animal histology, descriptive organic chemistry, quantitative chemical analysis (volumetric and gravimetric, pharmaceutical chemistry and experimental physics. Winter term—Vegetable physiology, human physiology, bacteriology, quantitative chemical analysis, pharmaceutical chemistry and experimental physics. Spring term—Vegetable physiology, advanced histology or bacteriology, organic chemistry and toxicology and urine analysis.

**Senior Year:** Fall term—Organic and inorganic chemistry (advanced work), materia medica, zoology (advanced and original work), botany (advanced and original work), mineralogy, blowpipe analysis, geology and psychology. Winter term—Organic or inorganic chemistry (advanced work), materia medica, zoology (advanced and original work), botany (advanced and original work), and geology. Spring term—Organic and inorganic chemistry (advanced work), zoology (advanced and original work), and botany (advanced and original work).

Rhetorical work and military drill required as of other students.

Students completing the *required studies* of the General Science Course and sufficient of the foregoing to make a total of thirty-nine terms' work during the course will be entitled to the degree of Bachelor of Science.

The University has six chemical laboratories. Of the three special chemical laboratories one is for urine analysis and one for toxicology. The University has also well equipped physical, zoological, bacteriological, botanical and mineralogical laboratories, in which the students of the special science course are required to do practical work.

Instruction in personal hygiene and sanitary science is given twice a week during the fall and winter terms. The course each term covers the subjects of food and drink, care of the person, clothing, exposure, healthy and unhealthy residence sites, modes of construction of houses, house drainage and sanitary plumbing, water supply, ventilation and heating, causes and prevention of contagious and other diseases, treatment of emergencies, preservation of the eyesight and hearing, etc.

Attendance upon these lectures during one term is required of all special students in the first year.

Courses are offered also in general, experimental, comparative, morbid and anthropological psychology.

## Auxiliary, Polyclinic and Post-Graduate Institutions and Courses.

### AUXILIARY DEPARTMENT OF MEDICINE, UNIVERSITY OF PENNSYLVANIA.

PHILADELPHIA, Pa. JOSEPH T. ROTHROCK, M. D., Dean.

ORGANIZED in 1865.

The faculty consists of five professors.

**COURSE OF INSTRUCTION:** The session of 1890-91 began October 1, 1890, and will continue until the early part of May. "There can be no matriculation until the student has entered upon his second year of medical study." Although strictly collateral to medicine and essential to the thorough education of the physician, the course is largely scientific in its character, and the degree of Bachelor of Science (B. S.) is conferred upon those graduates in medicine of the University, or of other recognized schools, who attend two full courses of lectures in the Auxiliary Department, pass a satisfactory examination before the faculty, and present an original thesis on some one of the subjects taught.

Lectures comprise medical jurisprudence and toxicology; mineralogy and geology; (including a practical course on mineralogical and geological chemistry); botany; hygiene; comparative anatomy and zoology. The session begins the first Tuesday in October and ends in May. The professor of comparative anatomy conducts, during the summer months, at a place on the Atlantic coast, a practical laboratory for special work in the subjects of his chair.

**FEES:** The lectures are free to students and graduates of the Department of Medicine of the University of Pennsylvania; to other matriculates, \$15 for each professor's ticket, or \$35 for the course; matriculation, \$5; graduation, \$10.

Number of students in attendance at each of the following sessions—

1880.....	125	1885-86.....	23
1881.....	96	1886-87.....	10
1882.....	57	1887-88.....	10
1883.....	43	1888-89.....	13
1884.....	55	1889-90.....	21

### NEW YORK POLYCLINIC.

NEW YORK CITY, JOHN A. WYETH, M. D., Secretary, 214 East Thirty-fourth street.

ORGANIZED in 1880-81 and opened in 1882.

The faculty consists of twenty-two professors, thirty-two lecturers, twenty-three instructors and thirty-eight clinical assistants.

**COURSE OF INSTRUCTION:** The winter session of 1890-91 began September 15, 1890, and will continue to June 15, 1891. The summer session will open at the expiration of the regular session in June 1891, and will continue into September.

Clinics are held throughout the year in diseases of the chest—of children—of general medicine—of the skin—of women—general and orthopedic surgery, physical diagnosis, gynecology, microscopy, ophthalmology, diseases of the mind and nervous system, laryngology and rhinology, otology, obstetrics, genito-urinary diseases and physiological chemistry will also receive much attention; pathological histology and state medicine.

**FEES:** General ticket for the year, tickets to five branches not included, \$350; general ticket for six months, \$250; three months, \$150; six weeks, \$100. Special courses for six weeks, \$15, excepting diseases of the chest and general medicine, operative gynecology, demonstrations in surgery, \$25; general surgery and diseases of women, \$35; throat, nose and ear, \$20.

**REMARKS:** This is strictly a school of clinical medicine and surgery. There are no didactic lectures, and none but practitioners admitted; matriculation at any time and for any length of time.

A Patho-Biological Laboratory has been fitted up in which special attention is paid to teaching bacteria culture.

Number of students in attendance at each session since the opening of the school:

1882-83.....161	1886-87.....301
1883-84.....182	1887-88.....337
1884-85.....229	1888-89.....383
1885-86.....210	1889-90.....422

## NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.

NEW YORK CITY. CLARENCE C. RICE, M. D., Secretary, 226 East Twentieth street.

**ORGANIZED** in 1882. The faculty consists of thirty-eight professors, fifty-nine instructors, one demonstrator and sixty-seven assistants.

**COURSE OF INSTRUCTION:** The regular term began September 15, 1890, and continues until June 15, 1891; the summer term begins June 16, 1891, and continues until September 15. Instruction is given by means of clinics, subjects and specimens. No undergraduates admitted.

Lectures are clinical and include the following courses: Clinical and orthopedic surgery and mechanical therapeutics, operative surgery, diseases of the mind and nervous system and electro-therapeutics, anatomy and pathology of the nervous system, ophthalmology and otology, diseases of the nose and throat, pathology, physical diagnosis and clinical medicine, urinary analysis, histology, pathological histology, diseases of children, obstetrics and gynecology, genito-urinary, and skin diseases, applied anatomy, practical pharmacy and medical chemistry, military, naval and state hygiene, diseases of women, therapeutics, microscopy and bacteriology; each department is open the entire year.

**FEES:** Annual ticket, \$350; semi-annual ticket, \$250; ticket for three months, \$150; special courses, of six weeks each, \$15 to \$35; certificates of attendance, \$5; general ticket, summer term, \$50; monthly ticket, \$25.

Number of students in attendance at each session since the opening of the school.

1882-83.....100	1886-87.....209
1883-84.....118	1887-88.....337
1884-85.....129	1888-89.....415
1885-86.....160	1889-90.....410

## PHILADELPHIA POLYCLINIC AND COLLEGE FOR GRADUATES IN MEDICINE.

PHILADELPHIA, Pa. SOLOMON SOLIS COHEN, M. D., Secretary, Broad and Lombard streets.

**ORGANIZED** in 1882. The faculty consists of eighteen professors, five adjunct professors, five instructors and thirty-one assistants.

**COURSE OF INSTRUCTION:** Clinical and practical instruction in medical and surgical specialties is afforded, to physicians only, during the whole year. Summer course will begin June 30, and continue until September 13, 1891. In addition to the clinical facilities of the college, the professors utilize, for purposes of instruction, their services in the Philadelphia, Pennsylvania, Wills, Howard, Episcopal, Presbyterian, German, St. Mary's and St. Christopher's hospitals.

Instruction is given in surgery, genito-urinary and venereal diseases, orthopedic surgery, diseases of the mind and nervous system, clinical chemistry, hygiene, diseases of the skin, diseases of the eye, practical gynecology, diseases of the chest, throat, ear and nose, clinical medicine, applied therapeutics, obstetrics and diseases of children.

**FEES:** General ticket for thirteen courses, for six weeks, \$100; single tickets for six weeks' duration, each \$15. For summer course, \$60; one month, \$30.

**REMARKS:** Students after finishing a complete course, may, by examination, become Fellows of the College. Two hundred and ninety-four physicians have attended courses at this polyclinic.

Number of students in attendance at each session since the opening of the school—

1882-83..... 26	1886-87..... 56
1883-84..... 41	1887-88..... 65
1884-85..... 69	1888-89..... 78
1885-86..... 73	1889-90.....102

## ST. LOUIS POST-GRADUATE SCHOOL OF MEDICINE.

ST. LOUIS, Mo. JUSTIN STEER, M. D., Secretary, Lucas and Jefferson avenues.

ORGANIZED in 1882. The faculty consists of fifteen professors, three clinical professors, one adjunct professor, one demonstrator, three chiefs of clinics, and seventeen clinical assistants.

COURSE OF INSTRUCTION: The course of instruction will begin first Monday in April, 1891, and continues eight weeks.

Lectures embrace practical medicine and principles of diagnosis, surgery and genito-urinary diseases, diseases of the skin, diseases of the chest and throat, ophthalmology and otology, electro-therapeutics and pathology, orthopedic surgery and joint diseases, diseases of women, nervous diseases and diseases of children, anatomy, chemistry, hygiene, gynecology, pathology, materia medica and pharmacy.

FEES: One full course of eight weeks, \$75.

NOTE: This school united with the Missouri Medical College in 1889.

## COLLEGE FOR MEDICAL PRACTITIONERS.

ST. LOUIS, Mo.

ORGANIZED in 1882.—Extinct in 1884.

## THE CLEVELAND POLYCLINIC AND POST-GRADUATE MEDICAL SCHOOL.

CLEVELAND, O.

ORGANIZED in 1884.—Extinct in 1885.

## BALTIMORE POLYCLINIC AND POST-GRADUATE MEDICAL SCHOOL.

BALTIMORE, Md.

ORGANIZED in 1884.—Extinct.

## SCHOOL OF BIOLOGY OF THE UNIVERSITY OF PENNSYLVANIA.

PHILADELPHIA, Pa. HORACE JAYNE, M. D., Dean.

ORGANIZED in 1885. The faculty consists of eight professors, five instructors and three demonstrators.

COURSE OF INSTRUCTION: Extends through two years of two terms each, and consists of practical laboratory exercises accompanied by explanatory lectures. No degrees are conferred. The course is open to women.

Studies embrace: First year—General biology, mammalian anatomy, botany, chemistry, drawing and Latin or German. Second year—Botany, zoology, animal histology, embryology, physiology, chemistry and Latin or German.

Number of students in attendance at each of the following sessions:

1884-85.....	2	1888-89.....	41
1885-86.....	28	1889-90.....	114
1886-87.....	21	1890-91.....	153
1887-88.....	35		

## CINCINNATI POLYCLINIC.

CINCINNATI, O.

ORGANIZED in 1886.—Suspended after being in operation one year.

## CHICAGO POLICLINIC.

CHICAGO, ILL. WILLIAM T. BELFIELD, M. D., Secretary, 612 Opera House Building.

ORGANIZED in 1886. The faculty consists of twenty-seven professors and twelve instructors and twelve assistants.

**COURSE OF INSTRUCTION:** The fifth year begun September 1, 1899. Systematic courses of daily clinical instruction, embracing all departments of practical medicine and surgery at the hospital and dispensary of the Polyclinic. These courses will be of about four weeks' duration, and will be continued throughout the year, and are exclusively for graduates and practitioners who have a legal right to practice. The teaching will be entirely clinical; didactic and formal lectures on practical branches being strictly excluded. Tickets may be taken out at any time, each good for one continuous course of four weeks from date of issue.

**FEES:** Matriculation (paid but once), \$5. Special courses of four weeks' duration, \$5 to \$25. A reduction of ten per cent. is made on the first month when tickets for three simultaneous courses are taken by one person. Tickets for a second course will be issued at two-thirds, and for a third course at one-half the above rates.

Number of students in attendance since the opening of the school (Oct. 1, 1886,) to Dec. 1, 1890—388.

## CHICAGO OPHTHALMIC COLLEGE.

CHICAGO, ILL.

INCORPORATED March 19, 1886.

## POST-GRADUATE MEDICAL SCHOOL AND CHARITY HOSPITAL OF CHICAGO.

CHICAGO, ILL. W. FRANKLIN COLEMAN, M. D., Secretary, 163 State street.

ORGANIZED in 1888 "to give clinical instruction to medical practitioners in the various departments of medicine and surgery."

The faculty consists of thirty-two professors, eight clinical lecturers, ten instructors, four assistants, ten visiting physicians and one pharmacist.

**COURSE OF INSTRUCTION:** "The clinical courses continue the year through, and tickets are issued at any time. Instruction is given in the order in which cases present themselves in the various departments of medicine and surgery"; diseases of the eye, of women, of children, of the nose and throat, of the ear, of the nervous system; surgery, operative surgery, clinical medicine, skin and venereal diseases, operative obstetrics, pathology and pathological histology. Beginning the first Tuesday in January, March, June and October, and continuing four weeks, special courses will be given in operative and experimental surgery, in medical diagnosis, in diagnostic pathology, and in eye, ear, nose and throat.

Matriculation, \$5; general ticket to all the departments except pathology and operations on the cadaver, four weeks, \$75; six weeks, \$100; six weeks (not including intubation), \$90; three months, \$150; ten per cent. discount on three or more tickets taken simultaneously.

The Charity Hospital contains large and comfortable wards for male and female patients, small rooms for critical cases, a well lighted operating room, lavatories, kitchen, dining-room and parlor.

Number of students in attendance since the opening of the school, September 1, 1889, to January 1, 1891,—84.

## THE NEW ORLEANS POLYCLINIC.

NEW ORLEANS, La. J. H. BEMISS, M. D., President, 158 Canal street.

ORGANIZED in 1888.

The faculty consists of thirteen instructors.

The term will open Wednesday, April 8, 1891, and continue for eight weeks.

**COURSE OF INSTRUCTION:** Mostly ward work and clinical teaching to graduates and advanced students of medicine; only lectures are given in the amphitheatre of the Charity Hospital. Certificates of attendance will be issued upon satisfactory evidence of good work on the part of the students.

Lectures embrace clinical, orthopedic and operative surgery and applied anatomy; histology; urinalysis; physical diagnosis and clinical medicine; gynecology; diseases of the nervous system; venereal diseases, and those of the skin, eye, ear, nose and throat; chemistry; dental and oral surgery; genito-urinary and rectal surgery; diseases of children.



**FEES:** Each single ticket, \$15; whole course, thirteen tickets, \$100.

There were twenty-three matriculates in the year 1888, thirty-eight in 1889. and forty-nine in 1890.

## POST-GRADUATE POLYCLINIC OF ECLECTIC MEDICINE AND SURGERY.

CHICAGO. E. J. FARNUM, M. D., 126 State street, Secretary.

**ORGANIZED 1890.** The faculty consists of twenty-three physicians and surgeons.

**COURSE OF INSTRUCTION:** Term begins after close of the winter session of the Bennett College of Eclectic Medicine and Surgery, and will continue throughout the summer. It is designed to be a course for practitioners, who can enter at any time, and receive certificate of attendance upon branches of instruction pursued after having attended the required time of six weeks. The exercises and clinics are held at the Bennett Medical College building. Clinics are held in surgery, medicine, gynecology, diseases of the eye and ear, dermatology, diseases of children, diseases of the chest and venereal diseases. Facilities are afforded for practical study of microscopy, chemistry and dissection.

**FEES:** General ticket, whole course of six weeks, \$75; single tickets, \$10 each, excepting practical microscopy, which is five dollars.

The following named institutions also have post-graduate courses, or other facilities for instruction for practitioners:

**UNIVERSITY OF MARYLAND, SCHOOL OF MEDICINE, Baltimore, Md.**—Courses of practical instruction of six weeks duration in urinary analysis, operative surgery, normal and pathological histology, obstetrics, diseases of women, of the eye, ear, nose, throat and chest.

**FEES,** for six six weeks course, \$7 to \$20 each branch; classes are formed throughout the year, as often as desirable.

**HARVARD UNIVERSITY, MEDICAL SCHOOL, Boston, Mass.**—Instruction will be given throughout the academic year, October to June, 1891. Courses mostly of eight weeks duration, in histology, physiology, medical chemistry, pathological anatomy, surgery, laryngology, ophthalmology, otology, dermatology, syphilis, diseases of the nervous system, gynecology, obstetrics, clinical medicine, ovarian tumors, rhinology, neurology, mental diseases, legal medicine, hygiene and bacteriology. Graduates of other medical schools may obtain the degree of M.D., at this University after a years' study in the graduates' course, and by passing the examinations of a three years' course.

**FEES:** Matriculation, \$5; for two months attendance, \$100; four months, \$150; throughout academic year, \$200. Long, continuous courses in any one branch at reduced rates.

**BELLEVUE HOSPITAL MEDICAL COLLEGE, New York City.**—Private instruction in medicine and in physical diagnosis (\$20 each), surgical operations and surgical dressings (\$15 each), physiological laboratory (\$50), practical chemistry (\$10), diseases of the eye and ear (\$30), pathological laboratory (\$15), diseases of the heart, lungs and throat (\$12), laryngoscopy (\$10). "Intended mainly for the benefit of practitioners."

LIST OF COLLEGES IN THE UNITED STATES AND CANADA, NOW IN  
OPERATION, BY STATES.

1. Medical College of Alabama, Mobile.
2. Medical Department, Arkansas Industrial University, Little Rock.
3. \*Cooper Medical College, San Francisco.
4. \*Medical Department, University of California, San Francisco.
5. California Medical College, San Francisco.
6. Hahneman Hospital College of San Francisco.
7. \*College of Medicine of the University of Southern California, Los Angeles.
8. University of Toronto Medical Faculty, Toronto.
9. Trinity Medical College, Toronto.
10. Royal College of Physicians and Surgeons, Kingston.
11. Medical Department of the Western University, London.
12. Woman's Medical College, Toronto.
13. Women's Medical College, Kingston.
14. McGill University, Faculty of Medicine, Montreal.
15. Ecole de Medecine et de Chirurgie, Montreal.
16. Laval University, Medical Departments, Quebec and Montreal.
17. University of Bishop's College, Faculty of Medicine, Montreal.
18. Halifax Medical College, Halifax.
19. Dalhousie University, Faculty of Medicine, Halifax.
20. Manitoba Medical College, Winnipeg.
21. University of Denver, Medical Department, Denver.
22. \*Medical Department, University of Colorado, Boulder.
23. \*Gross Medical College, Denver.
24. Yale University, Department of Medicine, New Haven.
25. \*National Medical College, Washington.
26. University of Georgetown, Medical Department, Washington.
27. †Howard University, Medical Department, Washington.
28. \*Medical Department, National University, Washington.
29. Medical College of Georgia, Augusta.
30. Atlanta Medical College, Atlanta.
31. Georgia College of Eclectic Medicine and Surgery, Atlanta.
32. Southern Medical College, Atlanta.
33. Woman's Medical College of Georgia, and Training School for Nurses, Atlanta.
34. Rush Medical College, Chicago.
35. Chicago Medical College, Chicago.
36. \*Hahneman Medical College and Hospital, Chicago.
37. Bennett College of Eclectic Medicine and Surgery, Chicago.
38. Woman's Medical College of Chicago.
39. Chicago Homeopathic Medical College, Chicago.
40. College of Physicians and Surgeons of Chicago.
41. \*Physio-Medical Institute, Chicago.
42. \*Physio-Medical College of Indiana, Indianapolis.
43. Medical College of Indiana, Indianapolis.
44. \*Central College of Physicians and Surgeons, Indianapolis.
45. \*Fort Wayne College of Medicine, Fort Wayne.

46. \*Indiana Eclectic Medical College, Indianapolis.
47. Eclectic College of Physicians and Surgeons, Indianapolis.
48. \*College of Physicians and Surgeons, Keokuk.
49. \*Medical Department, State University of Iowa, Iowa City.
50. \*Homeopathic Medical Department, State University of Iowa, Iowa City.
51. \*Iowa College of Physicians and Surgeons, Des Moines.
52. \*Iowa Eclectic Medical College, Des Moines.
53. Keokuk Medical College, Keokuk.
54. §University of Kansas, Preparatory Medical Course, Lawrence.
55. Wichita Medical College, Wichita, (Suspended).
56. The Kansas Medical College, Topeka.
57. University of Louisville, Medical Department, Louisville.
58. Kentucky School of Medicine, Louisville.
59. Louisville Medical College, Louisville.
60. Hospital College of Medicine, Louisville.
61. †Louisville National Medical College, Louisville.
62. Medical Department, Tulane University of Louisiana, New Orleans.
63. \*†New Orleans University, Medical Department, New Orleans.
64. Medical School of Maine, at Bowdoin College, Brunswick.
65. §Portland School for Medical Instruction, Portland.
66. University of Maryland, School of Medicine, Baltimore.
67. College of Physicians and Surgeons, Baltimore.
68. Baltimore Medical College, Baltimore.
69. Woman's Medical College of Baltimore.
70. Baltimore University School of Medicine, Baltimore.
71. §Johns Hopkins University, Medical Department, Baltimore.
72. Harvard University Medical School, Boston.
73. \*Boston University School of Medicine, Boston.
74. \*College of Physicians and Surgeons, Boston.
75. §Clark University, Worcester.
76. \*Department of Medicine and Surgery of the University of Michigan, Ann Arbor.
77. \*Homeopathic Medical College of the University of Michigan, Ann Arbor.
78. Detroit College of Medicine, Detroit.
79. Michigan College of Medicine and Surgery, Detroit.
80. \*Minneapolis College of Physicians and Surgeons, Minneapolis.
81. \*College of Medicine and Surgery, Minneapolis.
82. \*College of Homeopathic Medicine and Surgery, Minneapolis.
83. Missouri Medical College, St. Louis.
84. St. Louis Medical College, St. Louis.
85. Medical Department, University of Missouri, Columbia.
86. \*Homeopathic Medical College of Missouri, St. Louis.
87. Kansas City Medical College, Kansas City.
88. St. Louis College of Physicians and Surgeons.
89. \*American Medical College, St. Louis.
90. Northwestern Medical College, St. Joseph.
91. University Medical College of Kansas City.
92. Ensworth Medical College, St. Joseph.
93. Beaumont Hospital Medical College, St. Louis.
94. \*Kansas City Homeopathic Medical College, Kansas City.
95. \*St. Louis Hygienic College of Physicians and Surgeons, St. Louis.
96. The Marion-Sims College of Medicine, St. Louis.
97. Omaha Medical College, Omaha.
98. Medical Department, Cotner University, Lincoln.
99. Dartmouth Medical College, Hanover.
100. Medical and Surgical College of the State of New Jersey, Jersey City.

---

§ Do not grant medical degrees.

101. College of Physicians and Surgeons in the City of New York.
102. Albany Medical College, Albany.
103. University of the City of New York, Medical Department.
104. \*Medical Department of the University of Buffalo.
105. Long Island College Hospital, Brooklyn.
106. New York Homeopathic Medical College, New York City.
107. Bellevue Hospital Medical College, New York City.
108. New York Medical College and Hospital for Women, New York City.
109. \*Eclectic Medical College of the City of New York.
110. Woman's Medical College of the New York Infirmary, New York City.
111. \*College of Medicine of Syracuse University, Syracuse.
112. Medical Department of Niagara University, Buffalo.
113. †Leonard Medical School, Raleigh.
114. Medical College of Ohio, Cincinnati.
115. Western Reserve University, Medical Department, Cleveland.
116. \*Eclectic Medical Institute, Cincinnati.
117. Starling Medical College, Columbus.
118. \*Homeopathic Hospital Medical College, Cleveland.
119. Cincinnati College of Medicine and Surgery, Cincinnati.
120. Miami Medical College Cincinnati.
121. \*Medical Department of the University of Wooster, Cleveland.
122. \*Pulte Medical College, Cincinnati.
123. \*Columbus Medical College, Columbus.
124. \*American Eclectic Medical College, Cincinnati.
125. \*Toledo Medical College, Toledo.
126. Northwestern Ohio Medical College, Toledo.
127. Women's Medical College of Cincinnati.
128. \*National Normal University, Medical Department, Lebanon.
129. \*Medical Department Willamette University, Portland.
130. \*University of the State of Oregon, Medical Department, Portland.
131. University of Pennsylvania, Department of Medicine, Philadelphia.
132. Jefferson Medical College, Philadelphia.
133. Hahnemann Medical College and Hospital, Philadelphia.
134. Woman's Medical College of Pennsylvania, Philadelphia.
135. Medico-Chirurgical College of Philadelphia.
136. Western Pennsylvania Medical College, Pittsburg.
137. Medical College of the State of South Carolina, Charleston.
138. Medical Departments University of Nashville and Vanderbilt University, Nashville.
139. Medical Department University of Tennessee, Nashville.
140. Memphis Hospital Medical College, Memphis.
141. \*†Meharry Medical Department of Central Tennessee College, Nashville.
142. Chattanooga Medical College, Chattanooga.
143. Tennessee Medical College, Knoxville.
144. Hannibal Medical College, Memphis.
145. Texas Medical College and Hospital, Galveston.
146. Medical Department, University of Vermont, Burlington.
147. University of Virginia, Medical Department, Charlottesville.
148. Medical College of Virginia, Richmond.

---

\*Open to both sexes.

†Open to all without distinction of sex or color.

‡For colored students.

§Do not grant degrees.

## LIST OF EXAMINING AND LICENSING BODIES.

1. Medical Examining Board of Alabama.
2. Board of Examiners of the Medical Society of the State of California.
3. Board of Examiners of the California State Homeopathic Medical Society.
4. Board of Examiners of the Eclectic Medical Society of the State of California.
5. College of Physicians and Surgeons of Ontario.
6. College of Physicians and Surgeons of Quebec.
7. State Board of Medical Examiners of Colorado.
8. Boards of Medical Examiners of Florida.
9. State Board of Homeopathic Medical Examiners of Florida.
10. Illinois State Board of Health.
11. State Board of Medical Examiners of Iowa.
12. State Medical Examining Board of Minnesota.
13. Mississippi State Medical Association, Board of Censors.
14. State Board of Health of Missouri.
15. State Board of Medical Examiners of Montana.
16. State Board of Medical Examiners of New Jersey.
17. Board of Regents of the University of the State of New York—3 Boards.
18. Board of Medical Examiners of North Carolina.
19. State Board of Medical Examiners of North Dakota.
20. State Board of Medical Examiners of Oregon.
21. State Board of Medical Examiners of South Carolina.
22. Board of Medical Examiners, State of Tennessee.
23. Censors of the State Medical Society of Vermont.
24. Medical Examining Board of Virginia.
25. State Board of Health of West Virginia.
26. State Board of Medical Examiners of Washington.

# MEDICAL EDUCATION IN FOREIGN COUNTRIES, AND REGULATION OF THE PRACTICE OF MEDICINE.

## GREAT BRITAIN AND IRELAND.

[From the London *Lancet*, September 6, 1890.]

### GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

**REGISTRATION OF MEDICAL STUDENTS.**—The following are the General Medical Council's Regulations in reference to the registration of students in medicine:

Every medical student shall be registered in the manner prescribed by the General Medical Council. No medical student shall be registered until he has passed a preliminary examination as required by the General Medical Council, and has produced evidence that he has commenced medical study. The commencement of the course of professional study recognized by any of the qualifying bodies shall not be reckoned as dating earlier than fifteen days before the date of registration. The registration of medical students shall be placed under the charge of the branch registrars. Each of the branch registrars shall keep a register of medical students according to a prescribed form, and shall enter therein the name, the preliminary examination and date thereof, the date of registration, and the place and date of commencement of medical study, as certified by a master or teacher, or an official in a medical school or hospital. Every person desirous of being registered as a medical student shall apply to the branch registrar of the division of the United Kingdom in which he is residing; and shall produce or forward to the branch registrar a certificate of his having passed a preliminary examination as required by the General Medical Council, and evidence that he has commenced medical study. The branch registrar shall enter the applicant's name and other particulars in the Student's Register, and shall give him a certificate of such registration. Each of the branch registrars shall supply to the several qualifying bodies, medical schools, and hospitals, in that part of the United Kingdom of which he is registrar, a sufficient number of blank forms of application for the registration of medical students. The several Branch Councils—and in England the executive committee, if its meeting be more convenient and the case be urgent—have power to admit special exceptions to the foregoing regulations as to registration, for reasons which shall appear to them satisfactory. A copy of the Register of Medical Students, prepared by each of the branch registrars, shall be transmitted on or before December 31st, in each year, to the registrar of the General Council, who shall, as soon as possible thereafter, prepare and print, under the direction of the executive committee, an alphabetical list of all students registered in the preceding year, and supply copies of such authorized list to each of the bodies enumerated in Schedule A to the Medical Act (1858), and through the branch registrars to the several medical schools and hospitals. The several qualifying bodies are recommended not to admit to the final examination for a qualification under the Medical Acts any candidate (not exempted from registration) whose name has not been entered in the Medical Students' Register at least forty-five months previously. In the case of candidates from other than schools of the United Kingdom, the Branch Councils—and in England the executive committee, if its meeting be more convenient and the case be urgent—have power to admit exceptions to this recommendation. The regulations for preliminary general education are as follows:

No person shall be allowed to be registered as a medical student unless he shall have previously passed (at one or more examinations) a preliminary examination in the subjects of general education as specified in the following list:—1. English language, including grammar and composition. 2. Latin, including grammar, translation from specified authors, and translation of easy passages not taken from such authors. 3. Elements of mathematics, comprising (a) arithmetic, including vulgar and decimal fractions; (b) algebra, including simple equations; (c) geometry, including the first book of Euclid, with easy questions on the subject matter of the same. 4. Elementary mechanics of solids and fluids, comprising the elements of statics, dynamics and hydrostatics. 5. One of the following optional subjects:—(a) Greek, (b) French, (c) German, (d) Italian, (e) any other modern language, (f) logic, (g) botany, (h) zoology, (i) elementary chemistry.\*

\*In the case of students in Universities with a prolonged curriculum, where the examination in mechanics required for their degree is taken at a more advanced period of study than before commencing medical education, registration can be effected only on having passed the examination in mechanics, but their registration may be then antedated to the period at which the preliminary was passed.

The following resolutions in regard to professional education and examination were passed by the General Medical Council on June 5 and 6, 1890, and will become obligatory on every medical student who commences his medical studies after January 1, 1892. As they necessitate a year's further study than is now compulsory, the various examining bodies in the kingdom will during the next year be obliged to alter their curricula of study and their examinations so as to conform thereto.

**PROFESSIONAL EDUCATION.—1.** "The course of professional study after registration should occupy at least five years, conditionally."

2. "The first four of the five years should be passed at a school or schools of medicine recognized by any of the licensing bodies mentioned in Schedule A of the Medical Act (1858), provided that the first year may be passed at a university or teaching institute, recognized by any of the licensing bodies, where the subjects of physics, chemistry and biology are taught."

3. "Graduates in arts or science of any university recognized by the Medical Council who shall have spent a year in the study of physics, chemistry and biology, and have passed an examination in these subjects for the degrees in question, should be held to have completed the first of the five years of medical study."

4. "The fifth year should be devoted to clinical work at one or more of such public hospitals or dispensaries, British or foreign, as may be recognized by any of the medical authorities mentioned in Schedule A of the Medical Act (1858), provided that of this year six months may be passed as a pupil to a registered practitioner holding a public appointment, or possessing such opportunities of imparting practical knowledge as shall be satisfactory to the medical authorities."

5. "The regulations of the examining bodies, and of the schools, should be so framed that attendance on systematic courses may be concluded at the end of the fourth year of study, so as to permit of the student devoting the fifth year to clinical work, as defined in Resolution 4."

6. "The regulations requiring attendance on systematic courses of lectures ought not to require attendance on more than three lectures weekly in any one course."

7. "Due time should be set aside for practical work in the various subjects. Attendance on a practical course should be carefully ascertained and certified. By a practical course is understood one in which work is done by the student himself, under the direction of a duly qualified teacher."

8. "In order to promote a practical system of clinical teaching, the regulations should specify 'hospital practice with clinical instruction.' Ample time should be set aside for hospital work, and means should be taken to ascertain regularity of attendance in the wards and out patient departments. Every candidate for the final professional examination at the end of the fifth year should be required to give evidence that he has had sufficient opportunities of practical study."

This resolution relates to such offices as the following: Clinical medical clerkship and surgical dressership—either for in- or out-patients; obstetrical clerkship; post-mortem clerkship.

9. "No qualification in medicine ought to be granted without evidence of clinical instruction in infectious diseases."

**PROFESSIONAL EXAMINATION.—10.** "With the view of securing attention to practical work in education the time devoted to the practical part of the examinations, in all the subjects, should be extended."

11. "The examination in the elements of physics (including mechanics), chemistry and biology should be passed before the beginning of the second winter session."

12. "Antecedent to the final examination, there should be three professional examinations, arranged in such manner as to secure due continuity and sequence of study."

13. "All the examinations, except the final examination in medicine, surgery and midwifery, should be passed before the final year intended for clinical work."

14. "The final examination in medicine, surgery and midwifery must not be passed before the close of the fifth year of medical study."

15. "The system of compensation as between the three different subjects of the qualifying examinations—viz., medicine, surgery and midwifery—is contrary to the intention of the Medical Act (1858), and the Council directs the attention of the several medical authorities to this fact."

16. "The marks for the written and oral examinations in medicine and surgery at the final examination should not exceed those for the clinical and practical portions of the examination."

17. "Seeing that the practice of different authorities varies on the question whether a student who fails to satisfy the examiners in each of the several subjects of medicine, surgery and midwifery should be referred on all of them, or only on those in which he fails, the Council recommends that some general principle should be adopted with reference to this question; and suggests that a percentage of not less than 60 marks on each of any two subjects—supposing that the pass requirement be 50 per cent.—should exempt from re-examination in those two subjects."

18. "The Council recommends to the examining bodies the use of a percentage system of marks; and, for the facilitating the work of the inspectors appointed by the Council, the adoption of a uniform pass mark of 50 per cent."

19. "With regard to the course of study and examinations which persons desirous of qualifying for the medical profession shall go through in order that they may become possessed of the requisite knowledge and skill for the efficient practice of the profession, the Council now resolves that, in its opinion, the following conditions ought to be enforced without exception on all who commence their medical studies at any time after Jan. 1, 1892:—

(a) "With the exceptions provided for under Resolution 3, the period of professional study, between the date of registration as a medical student and the date of final examination for any diploma which entitles its bearer to be registered under the Medical Acts, must be a period of *bonâ fide* study during not less than five years:

(b) "In every course of professional study and examinations the following subjects must be contained: (i.) Physics, including the elementary mechanics of solids and fluids, and the rudiments of heat, light and electricity; (ii.) chemistry, including the principles of the science and the details which bear on the study of medicine; (iii.) elementary biology; (iv.) anatomy; (v.) physiology; (vi.) materia medica and pharmacy; (vii.) pathology; (viii.) therapeutics; (ix.) medicine, including medical anatomy and clinical medicine; (x.) surgery, including surgical anatomy and clinical surgery; (xi.) midwifery, including diseases peculiar to women and to new-born children; (xii.) theory and practice of vaccination; (xiii.) forensic medicine; (xiv.) hygiene; (xv.) mental disease." (It is to be understood and regards the above mentioned subjects, that the Council offers no opinion as to the manner in which the subjects should be combined or distributed for purposes of teaching or examination.)

(c) "At successive stated times during the first four years of the course of study, all students must pass such intermediate examinations as will test their proficiency in the successive earlier branches of medical education, and while tending to promote a due sequence in the medical studies, will also tend to lighten the final examination of matters which can properly be spared from it."

W. J. C. Miller, B. A., Registrar of the General Council and of the Branch Council for England, 299, Oxford street, London, W.—James Robertson, Registrar of the Branch Council for Scotland, 1, George square, Edinburgh.—R. L. Heard, M. D., Registrar of the Branch Council for Ireland, 35, Dawson street, Dublin.

## L.—UNIVERSITIES IN THE UNITED KINGDOM.

The following is a list of Examining Bodies whose examinations fulfil the conditions of the Medical Council as regards preliminary education, and have been recognized as entitling to registration as a medical or dental student; provided that the elementary mechanics of solids and fluids, comprising the elements of statics, dynamics, and hydrostatics, is shown to have been included in the examination:

**UNIVERSITY OF OXFORD.**—Junior local examinations; certificate to include Latin and Mathematics, and also one of these optional subjects—Greek, French, German. Senior local examinations; certificate to include Latin and Mathematics. Responsions. Moderations. Examinations for a degree in arts.

**UNIVERSITY OF CAMBRIDGE.**—Junior local examinations; certificate to include Latin and Mathematics, and also one of these optional subjects—Greek, French, German. Senior local examinations; certificate to include Latin and Mathematics. Higher local examinations. Previous examination. Examination for a degree in arts.

**UNIVERSITY OF DURHAM.**—Examination for certificate of proficiency. Examination for students at the end of their first year. Examination for a degree in arts.

**UNIVERSITY OF LONDON.**—Matriculation examination. Preliminary scientific (M. B.) Examination. Examination for a degree in arts or science.

**VICTORIA UNIVERSITY.**—Preliminary examination; Latin to be one of the subjects. Entrance examination in arts, to include all the subjects required.

**UNIVERSITY OF EDINBURGH.**—Local examinations (junior certificate); certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of these optional subjects—Greek, French, German. Local examinations (senior certificate); certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of these optional subjects—Greek, French, German. Preliminary examination for graduation in science or medicine and surgery. Examination for a degree in arts.

**UNIVERSITY OF ABERDEEN.**—Local examinations (junior certificate); certificate to include all the subjects required. Local examinations (senior certificate); certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of these optional subjects—Greek, French, German. Preliminary examination for graduation in medicine or surgery. Examination for a degree in arts.

**UNIVERSITY OF GLASGOW.**—Local examinations (junior certificate); certificate to include all the subjects required. Local examinations (senior certificate); certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of these optional subjects—Greek, French, German. Preliminary examination for graduation in medicine or surgery. Examination for a degree in arts.



UNIVERSITY OF ST. ANDREWS.—Local examinations (senior certificate); certificate to include English Literature, arithmetic, algebra, geometry, Latin, and also one of these optional subjects—Greek, French, German. Local examinations (junior certificate), to include all the subjects required. Preliminary examination for graduation in medicine or surgery. Examination for a degree in arts.

UNIVERSITY OF DUBLIN.—Public entrance examination. General examination at end of senior freshman year. Examination for a degree in arts.

QUEEN'S UNIVERSITY IN IRELAND.—Local examinations for men and women; certificate to include all the subjects required by the General Medical Council. Entrance or matriculation examination. Previous examination for B. A. Degree. Examination for a degree in arts.

ROYAL UNIVERSITY OF IRELAND.—Matriculation examination.

OXFORD AND CAMBRIDGE SCHOOLS EXAMINATION BOARD.—Certificate to include the following subjects, an adequate knowledge of English grammar and orthography, as shown in the course of the examination, to the satisfaction of the examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects: (a) arithmetic, including vulgar and decimal fractions; (b) algebra, including simple equations; (c) geometry, including the first two books of Euclid; (d) Latin, including translation and grammar; (e) also one of these optional subjects—Greek, French, German.

## II.—OTHER BODIES NAMED IN SCHEDULE A TO THE MEDICAL ACT.

APOTHECARIES' SOCIETY OF LONDON.—Examination in arts.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH.—Preliminary (combined) examination in general education.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—Preliminary examination in general education.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Preliminary examination; certificate to include mathematics.

## III.—EXAMINING BODIES IN THE UNITED KINGDOM, NOT INCLUDED IN SCHEDULE A TO THE MEDICAL ACT (1858).

COLLEGE OF PRECEPTORS.—Examination for a first class certificate, or second class certificate of first or second division, algebra, geometry, Latin, and either a modern language, or Greek or chemistry, or botany or zoology, having been taken.

QUEEN'S COLLEGE, BELFAST.—Matriculation examination.

QUEEN'S COLLEGE, CORK.—Matriculation examination.

QUEEN'S COLLEGE, GALWAY.—Matriculation examination.

INTERMEDIATE EDUCATION BOARD OF IRELAND.—Junior grade examination, middle grade examination, Senior grade examination, (certificate in each case to include all the subjects required).

ST. DAVID'S COLLEGE, LAMPETER.—Responsions examination, to include all the subjects required.

EDUCATIONAL INSTITUTE OF SCOTLAND.—Preliminary medical examination.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—Preliminary and minor examinations (*pro tanto*).

PHARMACEUTICAL SOCIETY OF IRELAND.—Preliminary examination (*pro tanto*).

SCOTCH EDUCATION DEPARTMENT.—Leaving certificates in each and in honors.

# REGULATIONS OF THE MEDICAL EXAMINING BOARDS IN THE UNITED KINGDOM.

(From the London Lancet, Sept. 6, 1890.)

## UNIVERSITY OF OXFORD.

There are two degrees in medicine, B. M. and D. M., and two degrees in Surgery, B. Ch. and M. Ch., and a diploma in Public Health.

The B. M. and B. Ch. degrees are granted to those members of the University who have passed the Second Examination. Graduates in Arts (B. A. or M. A.) are alone eligible for these two degrees. After the degree of B. A. is obtained, the degrees of B. M. and B. Ch. may be obtained by passing the following examinations: 1. Preliminary. 2. Professional. (a) First Examination: Subjects—Organic chemistry, unless the candidate has obtained a first or second class in chemistry in the Natural Science School; human physiology, unless he has obtained a first or second class in animal physiology in the Natural Science School; human anatomy. (b) Second Examination: Subjects—Medicine, surgery, midwifery, pathology, forensic medicine with hygiene, and materia medica with pharmacy.

The degree of D. M. is granted to Bachelors of Medicine of the University—(1) who took the degree of B. M. previously to the end of Trinity Term, 1886, provided they have spent three years in the practice of medicine after taking that degree, and have composed a dissertation on some medical subject approved by the Regius Professor of Medicine, before whom it must be read in public; (2) who took the degree of B. M. subsequently to the end of Trinity Term, 1886, provided they have entered their thirty-ninth term and have composed on some medical subject a dissertation which is approved by the professors in the faculty of medicine and examiners for the degree of B. M. whose subject is dealt with. A book published within two years of the candidate's application for the degree may be substituted for a dissertation. The degree of M. Ch. is granted to Bachelors of Surgery of the University who have entered their twenty-seventh term, who are members of the surgical staff of a recognized hospital, or have acted as dresser or house surgeon in such a hospital for six months, and who have passed an examination in surgery, surgical anatomy and surgical operations.

The diploma in Public Health is granted only to Bachelors of Medicine of the University who have passed an examination in hygiene, sanitary law, sanitary engineering and vital statistics.

The First Examination for the degree of B. M. and B. Ch. and the examination in materia medica and pharmacy may be passed as soon as the Preliminary Scientific Examination has been completed. Organic chemistry may be taken up on a separate occasion, but before human physiology and anatomy. The two last named subjects must be taken together.

The second examination may be passed after the completion of the first. Materia medica and pharmacy, if not already passed, may be offered separately, but before the remaining subjects, which must be taken together.

More detailed information may be obtained from the University calendar; the Examination Statutes, 1887, which contain the official schedules of the several subjects of examinations in both arts and medicine; from the Student's Handbook to the University; from the Regius Professor of Medicine; from the professors in the several departments of science.

## UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the colleges, or as a non-collegiate student, and keep nine terms by residence in the University. He must pass the Previous Examination in classics and mathematics, which may, and should if possible, be done immediately on coming into residence in October, or, what is better, obtain exemption through the Oxford and Cambridge Schools Examination Board or the Local Examinations, before commencing residence. He may then devote himself to medical study in the University, attending the hospital and the medical lectures, dissecting, etc. Or he may proceed to take a degree in Arts, either continuing mathematical and classical study and passing the ordinary examinations for B. A., or going out in one of the Honor Triposes. The natural sciences tripos is the most appropriate, as some of the subjects are practically the same as those for the first and second M. B. examinations.

**BACHELOR OF MEDICINE (M. B.)** Five years of medical study are required. This time may be spent in Cambridge or elsewhere. The first three or four years are usually spent in Cambridge, the student remaining in the University till he has passed (say) the examination for the natural sciences tripos and the first and second examinations for M. B. Cambridge being now a complete school of medicine, all the requisite lectures and hospital practice may be attended here, and many students remain to attend lectures and hospital practice until they have passed the first part of the third examination for M. B. The supply of subjects for dissection, etc., is unusually abundant.

There are three examinations for M. B. The *first* in chemistry and other branches of physics, and in elementary biology. These may be taken together or separately. The *second* in human anatomy and physiology, and in pharmaceutical chemistry. These may be

taken together or separately. The *third* may be also taken in two parts—viz., (1) principles and practice of surgery (with operative and clinical surgery) and midwifery and diseases of women, and (2) pathology, principles and practice of medicine, elements of hygiene, and medical jurisprudence. The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting-room, and in the laboratories.

Previously to the first examination, lectures must have been attended on chemistry (with manipulations). Previously to the second examination, the student must have attended lectures on human anatomy and physiology, have dissected for six months, and attended hospital practice six months. Previously to the first part of the third examination, he must have attended lectures on pathology, the principles and practice of surgery and midwifery, twenty cases of midwifery, and produce a certificate of proficiency in vaccination, and must also have acted as house surgeon or dresser for six months, and have gone through a course of instruction in practical surgery. Previously to the second part of the third examination, he must have attended lectures on the principles and practice of physics, the physiological action and therapeutic uses of drugs, and medical jurisprudence; also the medical and surgical practice of a hospital, with clinical lectures, for three years; and have been clinical clerk for six months. Before proceeding to the degree of M. B. the candidate must compose an original thesis on some one of the subjects prescribed for the several examinations, and defend the same in public before the Regius Professor of Physics.

As operative and clinical surgery now form parts of the third M. B. examination, candidates who have passed that examination are admitted to the degree of Bachelor of Surgery (B. C.) without separate examination, and without keeping an act.

DOCTOR IN MEDICINE may be taken three years after that of M. B. An act to be kept, consisting of an original thesis sustained in the public schools, with *viva-voce* examination; and an extempore essay has to be written on some subject relating to physiology, pathology, the practice of medicine, or state medicine.

MASTER IN SURGERY (M. C.).—The candidate must have passed all the examinations for B. C. He is required to pass an examination in surgical anatomy and surgical operations, pathology, and the principles and practice of surgery, and to write an extempore essay on a surgical subject. Before he can be admitted to this examination, two years at least must have elapsed from the time when he completed all required for the degree of B. C.

An abstract of the regulations and schedules of the range of the examinations in chemistry, physics, biology, and pharmacy may be obtained upon sending a stamped directed envelope to the Assistant Registrar, Cambridge. Full information is contained in the *Cambridge University Calendar*.

## UNIVERSITY OF LONDON.

MATRICULATION EXAMINATIONS take place on the second Monday in January and the second Monday in June. Candidates must be above sixteen years of age. The fee for the examination is £2. Provincial examinations are appointed by the Senate from time to time at specified centers. The examination appointed for January 13, 1891, will be held at Birmingham, Cardiff, Glasgow, Leeds and Portsmouth, as well as at London. That appointed for June, 1891, will be held also at Bangor, Birmingham, Cardiff, Edinburgh, Epsom, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, Nottingham and Sheffield. Several scholarships, exhibitions and prizes are associated with these examinations.

PRELIMINARY SCIENTIFIC (M. B.) EXAMINATION takes place twice in each year, once for pass and honors, commencing on the third Monday in July, and once for pass candidates only on the third Monday in January.\* No candidate will be admitted to this examination until he shall have passed the matriculation examination, nor unless he shall have given notice of his intention to the registrar at least one calendar month before the commencement of the examination. Fee for this examination, £5.

Candidates are examined for a pass or for honors on inorganic chemistry and experimental physics; and for a pass, on general biology. Candidates for honors, who have entered for the whole examination, may also be examined for honors in botany and zoology.

BACHELOR OF MEDICINE.—Every candidate for the degree of Bachelor of Medicine will be required—1. To have passed the matriculation examination in this University. 2. To have passed the preliminary scientific examination. 3. To have been engaged in his professional studies during four years subsequently to passing the preliminary scientific examination at one or more of the medical institutions or schools recognized by this University, one year at least of the four to have been spent in one or more of the recognized institutions or schools in the United Kingdom. 4. To pass two examinations in medicine.

\* Candidates for the degree of M.B. are required by the Senate to pass the preliminary scientific examination before commencing their regular medical studies, and are recommended to devote a preliminary year to preparation for it, according to the following programme:—Winter session: Experimental physics, chemistry (including inorganic), zoology. Summer session: Practical chemistry (inorganic), botany.

† Candidates who passed the matriculation examination in January, 1885, or previously, will be allowed to date the commencement of their professional studies, as heretofore, from that examination.

**INTERMEDIATE EXAMINATION.**—The intermediate examination in medicine takes place twice in each year, once for pass and honors, commencing on the second Monday in July, and once for pass candidates only, commencing on the third Monday in January. No candidate shall be admitted to this examination unless he have passed the preliminary scientific examination at least two years previously, and have produced certificates to the following effect:—1. Of having completed his nineteenth year. 2. Of having, subsequently to having passed the matriculation examination, been a student during two years at one or more of the medical institutions or schools recognized by this University, and of having attended a course of lectures on each of three of the subjects in the following list: Descriptive and surgical anatomy, histology and physiology, pathological anatomy, materia medica and pharmacy, general pathology, general therapeutics, forensic medicine, hygiene, obstetric medicine and diseases peculiar to women and infants, surgery, medicine. 3. Of having, after passing the preliminary scientific examination, dissected during two sessions. 4. Having, subsequently to having passed the preliminary scientific examination, attended a course of practical chemistry, comprehending practical exercises in conducting the more important processes of general and pharmaceutical chemistry, in applying tests for discovering the adulteration of articles of the materia medica and the presence and nature of poisons, and in the examination of mineral waters, animal secretions, urinary deposits, calculi, etc. 5. Of having attended to practical pharmacy, and of having acquired a practical knowledge of the preparation of medicines. These certificates (as is the case also with all the certificates hereinafter mentioned) must be transmitted to the registrar at least four weeks before the commencement of the examination. Fee for this examination, 25.

Candidates at the July examination are examined for a Pass or for Honors in each of the following subjects: (1) anatomy, (2) physiology and histology, (3) Organic chemistry, (4) materia medica and pharmaceutical chemistry. The Pass and Honors questions at the July examination will be given on one and the same paper, and will be divided into (a) Pass questions and (b) Honors questions. Candidates will be allowed to answer questions out of either or both groups; but no credit will be given for more than half of the total number of questions, of which half, in the case of candidates for Honors, one-third must be taken from group b. Immediately after the written examination, candidates desiring to proceed in Honors in any subject or subjects must give notice to the Registrar, in order that, when necessary, special provision may be made for the practical examinations. A candidate who enters for, but fails to obtain, Honors in any subject, may be recommended by the examiners for a Pass in that subject, if they are satisfied that he has shown such a competent knowledge thereof as is required by the regulations for the Pass Examination.

**M. B. EXAMINATION.\***—The M. B. Examination takes place twice in each year—once for Pass and Honors, commencing on the last Monday in October; and once for Pass candidates only, commencing on the first Monday in May. No candidate will be admitted to this examination within two academical years of the time of his passing the Intermediate Examination unless he be a registered medical practitioner of not less than three years' standing, in which case he must produce a certificate of having gone through the required course of training at some time previously. Every candidate must produce certificates to the following effect:—1. Of having passed the Intermediate Examination. 2. Of having, subsequently to having passed the Intermediate Examination, attended a course of lectures on each of two of the subjects enumerated in Section 2 of the regulations for that examination, and for which the candidate had not on that occasion presented certificates. 3. Of having conducted at least twenty labors. Certificates on this subject will be received from any legally qualified practitioner in medicine. 4. Of having attended the surgical practice of a recognized hospital or hospitals during two years, with clinical instruction and lectures on clinical surgery. 5. Of having attended the medical practice of a recognized hospital or hospitals during two years, with clinical instructions and lectures on clinical medicine. 6. Of having, after having attended surgical and medical hospital practice for at least twelve months subsequently to passing the Intermediate Examination, attended to practical medicine, surgery, or obstetric medicine, with special charge of patients, in a hospital, infirmary, dispensary, or parochial union, during six months, such attendance not to be counted as part of either the surgical or the medical hospital practice prescribed in Clauses 4 and 5. 7. Of having acquired proficiency in vaccination. Certificates on this subject will be received only from the authorized vaccinators appointed by the Privy Council. The candidate must also produce a certificate of moral character from a teacher in the last school or institution at which he has studied, as far as the teacher's opportunity of knowledge has extended. The fee for this examination is 25.

Candidates will be examined in the following subjects: General pathology, general therapeutics and hygiene, surgery, medicine, obstetric medicine, and forensic medicine. The examinations will include questions in surgical and medical anatomy, pathological anatomy, and pathological chemistry.

Any candidate who has passed the M. B. Examination, beginning in October, may be examined at the Honors Examination next following the M. B. Examination at which he has passed for Honors in (1) medicine, (2) obstetric medicine, and (3) forensic medicine. The examinations commence in the week following that in which the Pass Examination terminated. Except in the case of forensic medicine, they are conducted by means of printed papers, but the examiners will not be precluded from putting *viva voce* questions upon the written answers.

---

\* Any candidate for the M. B. Examination who has passed the Intermediate Examination under the former regulations will be required to have also passed the examination in physiology at some previous Intermediate Examination carried on under the present regulations, at which examination he shall not be allowed to compete for Honors.

**BACHELOR OF SURGERY.**—The examination for the degree of Bachelor of Surgery takes place once in each year, and commences on the Tuesday following the first Monday in December. Candidates must produce certificates to the following effect: 1. Of having passed the examination for the degree of Bachelor of Medicine in this University. 2. Of having attended a course of instruction in operative surgery, and of having operated on the dead subject. Fee for this examination, £5.

Any candidate who has passed the B. S. examination may be examined at the Honours examination next following the B. S. examination at which he has passed for Honours in Surgery. The examination takes place on Tuesday in the week following the Pass examination, and is conducted by means of printed papers.

**MASTER IN SURGERY.**—The examination for the degree of Master in Surgery takes place once in each year, and commences on the first Monday in December.

Candidates must produce certificates to the following effect: 1. Of having taken the degree of Bachelor of Surgery in this University.\* 2. Of having attended, subsequently to having taken the degree of Bachelor of Surgery in this University, (a) to clinical or practical surgery during two years in a hospital or medical institution recognized by this University; or (b) to clinical or practical surgery during one year in a hospital or medical institution recognized by this University, and of having been engaged during three years in the practice of his profession; or (c) of having been engaged during five years in the practice of his profession, either before or after taking the degree of Bachelor of Surgery in this University. One year of attendance on clinical or practical surgery, or two years of practice, will be dispensed with in the case of those candidates who at the B. S. examination have been placed in the first division. 3. Of moral character, signed by two persons of respectability.

Fee for this degree, £5. The examination is conducted by means of printed papers and *viva voce* interrogation.

Candidates will be examined in mental physiology, especially in its relations to mental disorder and in surgery.

Any candidate for the degree of M. S. may transmit to the Registrar, not later than October 1, a printed dissertation, thesis or commentary, written in view of candidature, or published within two academical years immediately preceding, treating scientifically some special department of surgical science, embodying the result of independent research, or showing evidence of his own work, whether based on the discovery of new facts observed by himself, or of new relations of facts observed by others, or generally tending to the advancement of surgical science. If the dissertation, or thesis, or commentary be approved by the examiners, the candidate will be exempted from the written and clinical examination in surgery, subject to such examination upon the thesis as the examiners at their discretion may think fit.

**DOCTOR OF MEDICINE.**—The examination for this degree takes place once in each year, and commences on the first Monday in December.

Candidates must produce certificates to the following effect: 1. Of having passed the examination for the degree of Bachelor of Medicine in this University. 2. Of having attended, subsequently to having taken the degree of Bachelor of Medicine in this University, (a) to clinical or practical medicine during two years in a hospital or medical institution recognized by this University, or, if he enter for State Medicine, during two years to State Medicine; or (b) to clinical or practical medicine during one year in a hospital or medical institution recognized by this University, or during one year to State Medicine as above, and having been engaged during three years in the practice of his profession; or (c) of having been engaged during five years in the practice of his profession, either before or after taking the degree of Bachelor of Medicine in this University. One year of attendance on clinical or practical medicine or two years of practice will be dispensed with in the case of those candidates who at the M. B. examination have been placed in the first division. 3. Of moral character, signed by two persons of respectability.

Fee for this degree, £5. The examination is conducted by means of printed papers and *viva voce* interrogation.

Candidates will be examined in mental physiology, especially in its relation to mental disorder, and in medicine.

The regulations with regard to theses are similar to those obtaining in connection with the examination for the M. S.

## UNIVERSITY OF DURHAM.

Three licenses and four degrees in medicine are conferred—viz.: Licences in medicine, in surgery, and in sanitary science; and the degrees of Bachelor in Medicine, Bachelor in Surgery, Master in Surgery, and Doctor in Medicine.

**BACHELOR IN MEDICINE (M. B.)**—There are three professional examinations for this degree: Subjects for the first examination are—Elementary anatomy and elementary physiology, chemistry and physics, and botany. Every candidate must produce the following certificates:—(1) Of registration as a medical student. (2) Of attendance on the following courses of lectures: Anatomy, physiology, chemistry with physics, and practical anatomy (dissections), each six months; botany and chemistry, each three months.

\* Candidates who have obtained the degree of Bachelor of Medicine previously to 1866 will be admitted to the examination for the degree of Master in Surgery without having taken the degree of Bachelor in Surgery; and in the case of such candidates the attendance on surgical practice required by regulation 2 may commence from the date of the M. B. degree.

The subjects for the second examination are—Anatomy, physiology, and materia medica with pharmacy, and the physiological action of drugs. For it the following certificates are necessary:—Lectures, &c.: Anatomy, physiology, and practical anatomy (dissections), second courses of six months each; materia medica, practical physiology, and practical pharmacy, courses of three months each. The candidate must also produce a certificate of his having passed the first examination for the M. B., or the first examination of the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England, together with the extra examinations in chemistry and botany of the University of Durham.

The subjects for the third examination are—Medicine, surgery, pathology, midwifery and diseases of women and children, medical jurisprudence, and public health. For it candidates must produce the following certificates—viz.: 1. Of being not less than twenty-one years of age. 2. Of good moral character. 3. Of having passed one of the following examinations in arts: (a) The examination for graduation in arts at one of the following universities—Oxford, Cambridge, Durham, Dublin, London, Queen's (Ireland), Edinburgh, Glasgow, St. Andrews, Aberdeen, Calcutta, Madras, Bombay, McGill College (Montreal), Queen's College (Kingston), Victoria (Manchester), and Royal (Ireland). Or (b) the preliminary or extra-professional examination for graduation in medicine at one of the following universities—Cambridge, London, Edinburgh, Glasgow, St. Andrews, Aberdeen, Queen's (Ireland), Victoria (Manchester), and Royal (Ireland), provided that the candidate in obtaining the certificate shall have satisfied the examiners in Greek. Candidates holding a certificate which does not include Greek may offer themselves for examination in that subject alone at the examination for the certificate for proficiency in general education at Durham, or at the preliminary examination in arts for the degrees in medicine above mentioned. This regulation will apply to all candidates entering for the degrees in medicine on or after October 1, 1888. Or (c) the preliminary examination in arts qualifying for the Membership of the Royal College of Physicians of London or for the Fellowship of the Royal College of Surgeons of England. Or (d) the preliminary examination in arts for the degrees in medicine of the University of Durham (in 1890, commencing on September 30). 4. Of attendance on the following course of lectures—viz.: Medicine and surgery, each two courses of six months; public health, one course; forensic medicine, midwifery and diseases of women and children, and pathology, each one course of three months; clinical medical and clinical surgical lectures, each two winters and two summers; medical hospital practice and surgical hospital practice and post-mortem demonstrations, each three winters and two summers; medical clinical clerking and surgical dressing, each six months; clinical obstetrics, three months; attendance on not less than twenty cases of midwifery, and instruction in vaccination.

**N. B.**—It is required that one of the four years of professional education shall be spent in attendance at the University College of Medicine, Newcastle-upon-Tyne. Candidates for the first examination who have passed the first examination of the Conjoint Board in England, and candidates who hold a qualification from a recognized licensing body in the United Kingdom, will be exempt from the first examination of the university, except in the subjects of chemistry with physics and botany. Candidates who have passed the first and second examinations of the University will be exempt from the first and second examinations of the Conjoint Board.

**BACHELOR IN SURGERY (B. S.)**—Every candidate for this degree must have passed the examination for the degree of Bachelor in Medicine of the University of Durham, and must have attended one course of lectures on operative surgery, and one course on regional anatomy. Candidates will be required to perform operations on the dead body, and to give proof of practical knowledge of the use of surgical instruments and appliances.

**MASTER IN SURGERY (M. S.)**—Candidates must not be less than twenty-four years of age, must have obtained the degree of Bachelor in Surgery of the University of Durham, and must have been engaged for at least two years subsequently to the date of acquirement of the degree of Bachelor in Surgery in attendance on the practice of a recognized hospital, or in the naval or military services, or in medical or surgical practice. The subjects of examination are: Principles and practice of surgery, surgical pathology, surgical anatomy, surgical operations and clinical surgery.

**DOCTOR OF MEDICINE (M. D.)**—For this degree candidates must not be less than twenty-four years of age, must have obtained the degree of M. B. at least two years previously, and in the interim have been engaged in medical and surgical practice. Each candidate will be required to write an essay on some medical subject selected by himself and approved by the Professor of Medicine, and to pass an examination thereon.

Candidates for any of the above degrees must give at least twenty-eight days' notice to the Registrar of the College.

#### VICTORIA UNIVERSITY.

Colleges of the University: Owens College, Manchester; University College, Liverpool, and Yorkshire College, Leeds.

Four degrees in medicine and surgery are conferred by the Victoria University—viz. Bachelor of Medicine and Bachelor of Surgery (M. B. and Ch. B.), Doctor of Medicine (M. D.), and Master of Surgery (Ch. M.).

All candidates for degrees in medicine and surgery are required—(1) to have matriculated in the University; and (2) to pass (either *before* or *after* matriculation) an examination called the entrance examination in arts, or to have passed such other examination as may be recognized by the University for this purpose.\*

**DEGREE OF BACHELOR OF MEDICINE.**—Before admission to the degree of M. B. candidates are required to present certificates that they will have attained the age of twenty-one years on the day of graduation, and that they have pursued the courses of study required by the University regulations during a period of not less than four years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in a college of the University, and one year at least having been passed in a college of the University subsequently to the date of passing the first M. B. examination. All candidates for the degrees of Bachelor of Medicine and Bachelor of Surgery are required, after matriculating, to satisfy the examiners in the several subjects of the following examinations: the first examination, the second examination, and the final examination.

**The First Examination.**—The subjects of examination are as follows:—(1) Chemistry; (2) elementary biology; (3) physics. Candidates for the preliminary examination in science must have attended during at least one year courses both of lectures and of laboratory work in each of the above named subjects.

**The Second Examination.**—The subjects of examination are as follows:—(1) Anatomy; (2) physiology (including physiological chemistry and histology); (3) materia medica and pharmacy. Candidates for the intermediate examination are required to have passed the first examination, and to have attended courses of instruction in anatomy for one winter session, in physiology for two winter sessions (but one session will be accepted provided that a full course has been attended by the candidate), and in materia medica and pharmacy for one summer session. The certificates must show (1) that dissection has been practiced during two winter sessions and one summer session at least; (2) that laboratory instruction has been received in physiology; (3) that practical instruction has been received in materia medica and pharmacy.

**The Final Examination.**—The subjects of examination are: (1) Surgery—systematic, clinical and practical; (2) medicine, systematic and clinical, including mental diseases and diseases of children; (3) forensic medicine and toxicology, and public health; (4) pharmacology and therapeutics; (5) obstetrics and diseases of women; (6) general pathology and morbid anatomy. Candidates may present themselves for examination in all the above subjects on the same occasion, provided they have completed the fourth year of medical study, in accordance with the regulations of the University. Candidates may, however, present themselves for examination in two or three only of these subjects, provided they have completed the *fourth winter* of medical study in accordance with the regulations of the University, but must satisfy the examiners in *all* the subjects so selected before presenting themselves in the remaining subjects of examination. Before presenting themselves for the final examination, candidates are required to have passed the intermediate examination, and to furnish certificates of having attended courses of instruction approved by the University, in a college of the University, or in a medical school recognised for this purpose by the University, in the subjects in which they offer themselves for examination. The following certificates will be required:—1. In medicine and surgery, of having attended the medical and surgical practice of a hospital or hospitals, approved by the University, during at least three years, of which years two at least must be subsequent to the date of passing the second examination, except when exemption has been granted by the General Board of Studies, after report from the Departmental Board of Medical Studies. 2. In pathology and morbid anatomy, of having attended during at least twelve months demonstrations in the post-mortem theatre of a hospital. 3. In obstetrics, of having attended, under proper supervision, at least twenty cases of labor. 4. In diseases of women, of having, during at least three months, received in either a general or a special hospital, approved by the University, such clinical instruction in the diseases peculiar to women as shall be approved by the University. 5. Of having acquired proficiency in vaccination. 6. Of having acted as a dresser for six months in the surgical wards, and as a clinical clerk for six months in the medical wards, of a hospital recognised by the University. 7. Of having attended courses of instruction, approved by the University, in a college of the University, or in a medical school or hospital recognised for this purpose by the University, in the following subjects of examination:—(a) systematic surgery, one winter session; practical surgery, one winter session; clinical surgery, two years of clinical lectures. (b) Systematic medicine, two winter sessions; clinical medicine, two years of clinical lectures. (c) Forensic medicine, one summer session; public health, one summer session. (d) Pharmacology and therapeutics, one winter or one summer session. (e) Obstetrics and diseases of women, two summer sessions or one winter session. (f) General pathology and morbid anatomy, one winter and one summer session.

**DEGREE OF DOCTOR OF MEDICINE.**—Candidates are not eligible for the degree of doctor of medicine unless they have previously received the degree of Bachelor of Medicine, and at least one year has elapsed since they passed the examination for that degree. Candidates for the degree of Doctor of Medicine are required to present a printed dissertation embodying the results of personal observations or original research, either in some department of medicine or of some science directly relative to medicine. No candidate will be

---

\*The examinations at present recognized are:—1. The preliminary examination of the Victoria University, provided Latin and mechanics have been taken up. 2. The matriculation examination of the University of London. 3. The previous examination of the University of Cambridge. 4. Responsions and moderations of the University of Oxford. 5. The leaving certificate examination of the Oxford and Cambridge Boards, provided that it include Latin, English, mathematics and elementary mechanics. 6. The final examination for graduation in arts of any University in Great Britain and Ireland.

admitted to the degree unless his dissertation, after report from the Departmental Board of Medical Studies, shall have been recommended by the General Board of Studies to the Council for acceptance in that behalf. Candidates may be examined on any subject connected with their dissertations.

**DEGREE OF MASTER OF SURGERY.**—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degree of Bachelor of Surgery, and at least one year has elapsed since they passed the examination for that degree. The subjects of examination are as follows: (1) surgical anatomy; (2) surgical pathology; (3) practical surgery, including the performance of operations on the dead body; (4) clinical surgery; (5) ophthalmology.

## UNIVERSITY OF EDINBURGH.

Three medical degrees are conferred by the University of Edinburgh—namely, Bachelor of Medicine (M. B.), Master in Surgery (C. M.), and Doctor of Medicine (M. D.). The degree of Master in Surgery is not conferred on any person who does not also at the same time obtain the degree of Bachelor of Medicine.

**BACHELOR OF MEDICINE AND MASTER IN SURGERY.**—No one is admitted to these degrees who has not been engaged in medical and surgical study for four years—the medical session of each year, or *annus medicus*, being constituted by at least two courses of not less than one hundred lectures each, or by one such course and two courses of not less than fifty lectures each; with the exception of the clinical courses, in which lectures are to be given at least twice a week during the prescribed periods.\*

Every candidate for the degrees of M. B. and C. M. must give sufficient evidence by certificates—(a) That he has studied each of the following departments of medical science—namely, anatomy, chemistry, materia medica, institutes of medicine or physiology, practice of medicine, surgery, midwifery and the diseases peculiar to women and children, and general pathology, each during courses including not less than one hundred lectures; practical anatomy, a course of the same duration as those of not less than one hundred lectures;† Practical chemistry, three months; practical midwifery—(1) that he has attended at least twelve cases of labor under the superintendence of a registered medical practitioner, or (2) that he has attended six such cases, and also has attended, for at least three months, the practice of a midwifery hospital in which practical instruction is regularly given; clinical medicine and clinical surgery,‡ courses of the same duration as those of not less than one hundred lectures, or two courses of three months' lectures, being given at least twice a week; medical jurisprudence, botany, and natural history (including zoology), during courses including not less than fifty lectures. (b) That he has attended, for at least two years, the medical and surgical practice of a general hospital which accommodates not fewer than eighty patients, and possesses a distinct staff of physicians and surgeons. (c) That he has attended, during a course of not less than fifty hours' instruction, the class of practical materia medica and pharmacy in the University of Edinburgh, or a similar class conducted in a university or recognized school of medicine, or a similar class conducted at the laboratory of a hospital or dispensary, or elsewhere, by a teacher recognized by the University Court; or that he has been engaged by apprenticeship for not less than two years with a registered medical practitioner, or a member of the Pharmaceutical Society of Great Britain, or a member of the Pharmaceutical Society of Ireland, or a pharmaceutical chemist, or chemist and druggist, registered under the provisions of the Act for Regulating the Qualifications of Pharmaceutical Chemists, 1852, the pharmacy act, 1868, or the pharmacy act (Ireland), 1875, in the *bona fide* compounding and dispensing of drugs, and the preparation of their official and other preparations under his superintendence. (d) That he has attended, for at least six months, by apprenticeship or otherwise, the outdoor practice of a hospital, or the practice of a dispensary physician, a surgeon, or a member of the London or Dublin Society of Apothecaries. (e) That he has attended, during courses of not less than fifty hours' instruction, classes of practical physiology and practical pathology in the University of Edinburgh, or in a recognized university or school of medicine, or upon classes thereof, conducted by a teacher recognized by the University Court.

Students of medicine in the London schools, and in the school of the College of Surgeons in Dublin, can obtain there two *anni medici* out of the four required for the Edinburgh degrees in Medicine. Courses of lectures in these schools, and the courses of the medical teachers and of the science teachers in King's College and in University College, London, in the subjects of graduation, are regarded as equivalent to lectures on the corresponding subjects in this University, except materia medica and midwifery, which when only three months' courses are not received as equivalent. One *annus medicus* may be constituted by attendance on practical anatomy and hospital practice during the winter

\* No course of lectures will be allowed to qualify unless the lecturer certifies that it has embraced at least one hundred lectures, or fifty lectures, in conformity with the requirements of this section. Three months' courses on materia medica, pathology, and midwifery do not qualify.

† Certificates of attendance on practical anatomy must express not only the number of months engaged in dissection, but the names of the parts dissected, and the degree of care with which the dissections have been made. Students are recommended not to appear for an examination in anatomy with a view to a degree until they have dissected the human body at least once.

‡ The Medical Faculty recommend that medical students should not attend clinical surgery during their first six months' attendance on clinical medicine.



ession. Another *annus medicus* by attending either (a) full winter courses on any two of the following subjects—*anatomy, physiology, chemistry, pathology, surgery, medicine, clinical surgery, clinical medicine*; or (b) on one such course and two three months' courses on any of the following subjects—*botany, practical chemistry, natural history, medical jurisprudence*. If the student selects the arrangement prescribed in a, attendance on a third course, although unnecessary to constitute an *annus*, will also be accepted. The other subjects and the additional courses, not given in London or Dublin, necessary for the degrees of the University, require to be attended at this University. In provincial schools, where there are no lectures recognized by the University Court, a candidate can only have one *annus medicus*, and this is constituted by attendance at a qualified hospital along with a course of practical anatomy. But in a provincial school where there are two or more lecturers recognized by this University, a second *annus medicus* may be made by attendance on at least two six months' or one six months' and two three months' recognized courses.

Every candidate must deliver, before the 31st day of March of the year in which he proposes to graduate, to the Dean of the Faculty of Medicine, a declaration in his own handwriting, that he has completed his twenty-first year, or that he will have done so on or before the day of graduation, and that he will not be on the day of graduation under articles of apprenticeship to any surgeon or other master. This declaration, along with a statement of studies, accompanied with proper certificates, is appended to the schedule of the final examination, and must be signed before the schedule is given in.

Each candidate is examined, both in writing and orally, on chemistry, botany and natural history; on anatomy, institutes of medicine, *materia medica* (including practical pharmacy and prescribing), and pathology; on surgery, practice of medicine, midwifery and medical jurisprudence; clinically, on medicine and on surgery in a hospital. The examinations on anatomy, chemistry, institutes of medicine, botany, natural history, *materia medica* and pathology are conducted, as far as possible, by demonstrations of objects placed before the candidates. Students who have passed their examination on the first division of these subjects may be admitted to examination on the second division at the end of their third year. The examination on the third and fourth divisions cannot take place until the candidate has completed his fourth *annus medicus*. Candidates may, if they choose, be admitted to examination on the first two of these divisions at the end of their third year, or to the four examinations at the end of their fourth year.

**DOCTOR OF MEDICINE.**—This degree may be conferred on any candidate who has obtained the degrees of Bachelor of Medicine and Master in Surgery, and who is of the age of twenty-four years, and produces a certificate of having been engaged, subsequently to his having received the degrees of M. B. and C. M., for at least two years in attendance on a hospital, or in the military or naval medical service, or in medical and surgical practice. Provided always that the degree of M. D. shall not be conferred on any person unless he be a graduate in arts of one of the Universities of England, Scotland or Ireland, or of such other universities as are above specified, or unless he shall, before or at the time of his obtaining the degrees of M. B. and C. M., or thereafter, have passed a satisfactory examination on three of the subjects mentioned in Section II. of the statutes relative to preliminary examination. Two of these must be Greek and logic or moral philosophy, and the third is to be one of the following subjects, at the option of the candidate—namely, French, German, higher mathematics and natural philosophy. And provided also that the candidate for the degree of M. D. shall submit to the Medical Faculty a thesis, certified by him to have been composed by himself, and which shall be approved by the Faculty, on any branch of knowledge comprised in the professional examinations for the degrees of M. B. and C. M. which he may have made a subject of study after having received these degrees.

## UNIVERSITY OF GLASGOW.

The fees for the degrees are £21 for M. B. and C. M., which are obtained together, and £15 for M. D.

A syllabus containing further particulars may be obtained by application to the assistant clerk, Matriculation Office, the University.

The first, second and third professional examinations are held in April and October each year, and the fourth or final examination is held annually in June and July.

The candidate for the degrees of Bachelor of Medicine and Master in Surgery must have been registered in the books of the General Medical Council at least four years prior to the date of his graduation.

A degree in Arts (not being an honorary degree) of any of the Universities of England, Scotland and Ireland, and also a degree in arts of any colonial or foreign university which may for this purpose have been specially recognized by the University Court, shall exempt candidates from all preliminary examination.

The examination in general education may be passed either in this University or at any university or board of which the examinations are recognized by the General Medical Council as entitling to registration. But while a certificate of having passed any recognized preliminary examination entitles to registration in the books of the General Medical Council, the University only accepts these examinations *pro tanto*, and exacts examination in every case on such subjects required by the regulations of the University as are not embraced in the certificates presented from other examining boards, or which, though included therein, are not of similar extent to the same subjects as prescribed by the University. In such cases this examination required by the University must be passed by the candidates before enrolment for their first professional examination.

This registration in the books of the Medical Council, which is imperative on candidates for any legal qualification to practice whatsoever, is quite distinct from matriculation or other registration of students in the books of the University.

Candidates for the degrees of Bachelor of Medicine and Master in Surgery are further required to undergo, previously to their first professional examination (and it is recommended, as far as possible previously to the commencement of professional study), an examination in one of the following subjects: Greek, French, German, Higher Mathematics, Natural Philosophy, Logic and Moral Philosophy.

**PROFESSIONAL EDUCATION:** 1. *Duration and Constitution of the Curriculum.*—No one shall be admitted to the degree of Bachelor of Medicine or Master in Surgery who has not been engaged in medical and surgical study for four years—the medical session of each year, or *annus medicus*, being constituted by at least two courses of not less than one hundred lectures each, or by one such course and two courses of not less than fifty lectures each; but in the case of the clinical courses it shall be sufficient that the lectures be given at least twice a week during the prescribed periods.

One at least of the four years of medical and surgical study above required must be in the University of Glasgow. Another of such four years must be either in the University of Glasgow, or in some other university entitled to give the degree of Doctor of Medicine.

All candidates availing themselves of the permission to attend the lectures of private teachers, and not being at the time matriculated students of the University, must, at the commencement of the year of such attendance, enrol their names in a book kept by the university for that purpose, paying a fee of one-half the amount of the matriculation fee paid by students of the University; but they shall not thereby be entitled to any of the privileges of a matriculated student of the University.

The fee for attendance on the lectures of any private teacher, with a view to graduation, shall not be of less amount than that exigible by medical professors of the University for the same course of instruction.

No attendance on lectures shall be reckoned, if the teacher gives instruction in more than one of the prescribed branches of study, except in those cases where professors of the University are at liberty to teach more than one branch.

The terms for conferring Medical and Surgical degrees are May 1st, July 31st, and second last Thursday of November.

**THE DEGREE OF DOCTOR OF MEDICINE.**—This degree may be conferred on any candidate who has obtained the degree of Bachelor of Medicine, and is of the age of twenty-four years, and has been engaged, subsequently to his having obtained the degree of bachelor of medicine, for at least two years in attendance on a hospital, or in the military or naval medical service, or in medical or surgical practice; provided always that the degree of Doctor of Medicine shall not be conferred on any person, unless he be a graduate in arts within the fifth session of the Ordinance, or unless he shall have passed a satisfactory examination in Greek, and in logic or moral philosophy, and in one at least of the following subjects, namely: French, German, higher mathematics, natural philosophy, and natural history; provided also that each candidate for the degree of Doctor of Medicine shall present an inaugural dissertation composed by himself to be approved by the *Senatus Academicus*. Such dissertations or theses must be lodged with the assistant clerk (matriculation office), on or before March 20th, June 20th, or October 20th. No theses will be approved unless it gives evidence of original observation, or, if it deals with the researches of others, gives a full statement of the literature of the question, with accurate references and critical investigation of the views or facts cited; mere compilations will in no case be accepted. The fees for the degree of M. D. amount to £15 8s. (including the sum of £10 3s for government stamps, etc.)

A special examination will be held once in every year in subjects relating to public health, and will commence on the third Tuesday in October. Candidates must produce evidence that they have attended a course of lectures in which special instruction was given on public health, and that they have attended a course of analytical chemistry specially bearing on the subject of examination. Candidates who have not passed an *annus medicus* in the University of Glasgow must, before presenting themselves for examination, have attended as matriculated students in this university at least two courses of instruction, scientific or professional, bearing on the subjects of examination. The examinations shall be written, oral and practical. Further information with regard to the lectures on public health and the examinations for the diploma may be obtained from Dr. P. A. Simpson, Professor of Medical Jurisprudence, University of Glasgow.

## UNIVERSITY OF ABERDEEN.

The curricula for the several degrees conferred are nearly the same as in the University of Edinburgh. Professional examinations will be held twice in each year—namely, in April and July, directly after the close of the winter and summer sessions. The fees for graduation are the same as in the University of Edinburgh. Matriculation fee, including all dues, for the winter and summer session, £1; summer session alone, 10s.

Candidates who commenced their medical studies before November, 1861, are entitled to appear for examination for the degree of M. D. after four years' study, one of which must have been in the University of Aberdeen.

Besides the Royal Infirmary, students have the opportunity of attending the following institutions: General Fever Hospital; Sick Children's Hospital; General Dispensary, and Lying-in and Vaccine Institutions, daily; Royal Lunatic Asylum; Eye Institution, in which is given clinical instruction on the diseases of the eye, and on the application of the ophthalmoscope for their diagnosis.

A Diploma in Public Health is granted by the University to its graduates in Medicine, after a special examination. The diploma can be entered on the Register of the General Medical Council.

**DIPLOMA IN PUBLIC HEALTH (D. P. H.)**—Candidates for the diploma must have graduated in medicine in the University for one year before they receive the diploma; and they must give evidence of having attended a course of instruction in analytical chemistry or in practical hygiene. The diploma is conferred after an examination in public health, held twice each year. Candidates desiring to appear for examination at either of these periods must send their names, with the necessary fee, to the Secretary of the Medical Faculty before the first day of the month in which the examination takes place. The fee for the examination is £3 3s. In the event of a candidate failing to pass the examination, a fee of £1 1s. will be charged for each subsequent examination for which he may enter. The examination is conducted by the examiners for the medical degrees. The examination is written, oral and practical. The subjects and scope of the examination are as follows: 1. Physics and meteorology. The general principles of physics in so far as they relate to heat and ventilation, water-supply and drainage; the elements of meteorology and climatology; practical exercises in the use of meteorological instruments. 2. Chemistry and microscopy: The composition and analysis of air, water and sewage; the composition and adulterations of the more common foods and beverages; diseased and putrid food; practical exercises in the chemical and microscopical examination of air, water and foods. 3. General hygiene: Duties of medical officers of health; nature and construction of dietaries; construction and sanitary arrangements of houses, hospitals, workshops, factories, towns, etc., including interpretation of plans; ventilation, water-supply, sewerage, disposal of dead; etiology, prophylaxis (including vaccination) and control of infectious diseases; unhealthy occupations; practical exercises in examining and reporting on the construction and sanitary arrangements of houses, etc. 4. Sanitary law and vital statistics: Laws relating to the public health of Scotland, England or Ireland, at the option of the candidate; laws relating to vaccination and registration of births, marriages and deaths; methods and data of vital statistics, mainly in so far as they relate to the birth, marriage and death rate of communities.

Application for further information should be addressed to the Dean of the Medical Faculty.

The degrees of B. Sc. and D. Sc. are now granted, after examination, in one of several specified departments of science, to be selected by the candidate. For regulations apply to the Secretary of Science Department.

#### UNIVERSITY OF ST. ANDREWS.

Two degrees in medicine are granted—namely, Bachelor of Medicine and Master in Surgery (M. B., C. M.), and Doctor of Medicine (M. D.). The curricula for these degrees, and the regulations under which they are conferred differ from those of the University of Edinburgh only in the particulars noticed below.

**DOCTOR OF MEDICINE.**—This decree may be conferred by the University of St. Andrews or any registered medical practitioner above the age of forty years whose professional position and experience are such as, in the estimation of the University, to entitle him to that decree, and who shall, on examination, satisfy the medical examiners of the sufficiency of his professional knowledge; provided always that degrees will not be conferred under this section on a greater number than ten in any one year. The examinations are held yearly about the middle of April. Candidates must lodge with the Dean of the Medical Faculty the following certificates, along with application for admission to examination: 1. A certificate of age, being a baptismal certificate or an affidavit. 2. Holograph certificates from at least three medical men of acknowledged reputation in the medical profession or in the medical schools, recommending the candidate to the Senatus for the degree, and testifying to his professional skill and position. 3. A portion of the graduation fee (*viz.*, £10 10s.), which shall be forfeited should the candidate fail to appear or to graduate at the time appointed. A satisfactory examination, written and *visà voce*, must be passed in the following departments, *viz.*: *Materia medica* and general therapeutics, medical jurisprudence, practice of medicine and pathology, surgery, midwifery and diseases of women and children.

**BACHELOR OF MEDICINE AND MASTER IN SURGERY.**—No one will be received as a candidate for the degree of Bachelor of Medicine and Master in Surgery unless two years at least of his four years of medical and surgical study shall have been in one or more of the following universities or colleges, *viz.*: the Universities of St. Andrews, Glasgow, Aberdeen, Edinburgh, Oxford and Cambridge; Trinity College, Dublin; Queen's College, Belfast; Queen's College, Cork, and Queen's College, Galway.

Subject always to the condition here specified, the studies for candidates for the degree of Bachelor of Medicine and Master in Surgery will be under the following regulations: The remaining years of medical and surgical study may be either in one or more of the universities and colleges above specified, or in the hospital schools of London, or in the school of the College of Surgeons of Dublin, or under such private teachers of medicine as may from time to time receive recognition from the University Court. Attendance during at least six winter months on the medical or surgical practice of a general hospital which accommodates at least eighty patients, and during the same period on a course of practical anatomy, may be reckoned as one of such remaining years.

Every candidate for examination for the degree of M. B. and C. M. is required to lodge a declaration of age, a statement of his course of study, his inaugural dissertation, and all his certificates with the Dean of the Medical Faculty, on or before the 25th of March in each year.

### UNIVERSITY OF DUBLIN (TRINITY COLLEGE).

**MATRICULATION.**—All students in the school of physic intending to practice physic must be matriculated, for which a fee of 5s. is payable. No student can be admitted for the winter course after November 25.

**PREVIOUS MEDICAL EXAMINATION.**—Candidates for degrees in medicine, surgery and midwifery are required to pass an examination in physics, chemistry, botany, comparative anatomy, descriptive anatomy, and institutes of medicine (practical histology and physiology), previously to their degree examination.

**BACHELOR IN MEDICINE.**—A candidate for this degree must be a graduate in Arts, and may obtain the degree of Bachelor in Medicine at the same commencements as that at which he receives his degree of B. A., or at any subsequent commencements. The medical education of a Bachelor in Medicine is of four years' duration, and comprises attendance on a single course of each of the following lectures: Anatomy, practical anatomy, chemistry, materia medica and pharmacy, physiology, practice of medicine, botany, medical jurisprudence, heat, electricity, magnetism, comparative anatomy; three courses of nine months' attendance on the clinical lectures of Sir Patrick Dun's or other metropolitan hospital recognized by the Board of Trinity College; a certificate of personal attendance on fever cases, with names and dates of cases. Six months' dissections, three months' laboratory instruction in chemistry, three months' practical histology, and one month's instruction in vaccination are required. Any of the above-named courses may be attended at any medical school in Dublin recognized by the Provost and Senior Fellows. Fee for the *Liceat ad Examinandum*, £5; for the M. B. degree, £11.

**DOCTOR IN MEDICINE.**—A Doctor in Medicine must be M. B. of at least three years' standing, or have been qualified to take the degree of M. B. for three years, and must read a thesis or undergo an examination before the Regius Professor of Physic, in accordance with the rules and statutes of the University. Total amount of fees for this degree, £15.

**BACHELOR IN SURGERY.**—A Bachelor in Surgery must be a Bachelor in Arts, and have spent four years in the study of surgery and anatomy. He must also pass a public examination in the hall before the professors of the school of physic, having previously completed the prescribed curriculum of study, which includes the following additions to the courses named above for the M. B.: Theory of surgery, operative surgery, two courses of dissections, ophthalmic surgery. Candidates are required to perform surgical operations on the dead subject.

**MASTER IN SURGERY.**—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin, of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass an examination in the following subjects:—1, clinical surgery; 2, operative surgery; 3, surgical pathology; 4, surgery; 5, surgical anatomy (on the dead subject); and one of the following optional subjects: 1, surgery, in one of its recognized branches—viz., ophthalmic and aural, gynecological, and dental; 2, mental diseases; 3, medical jurisprudence and hygiene; 4, advanced anatomy and physiology; 5, comparative anatomy. Fee for the degree of Master in Surgery, £11.

**BACHELOR IN OBSTETRIC SCIENCE.**—The candidate for the B. A. O. Examination must be a Bachelor in Arts, having previously completed the prescribed curriculum of study. The curriculum comprises the following, in addition to the complete course for the M. B.:—Theory and practice of midwifery, one course (winter); practical midwifery, including clinical lectures, six months. The candidate is then required to pass an examination in practical midwifery, gynecology and obstetrical anatomy. Fee for the degree of Bachelor in Obstetric Science, £1. There is no *Liceat* fee.

**MASTER IN OBSTETRIC SCIENCE.**—A Master in Obstetric Science must have passed the M. B. and B. Ch. examinations, and produce a certificate of having attended a summer course in obstetric medicine and surgery.\* He is then required to pass an examination in the following subjects—1, Practice of midwifery. 2, Gynecology. 3, Anatomy of female pelvis and elementary embryology. 4, Clinical gynecology. Fee for the degree of Master in Obstetric Science, £5.

**UNIVERSITY DIPLOMAS.**—Candidates for the diplomas in medicine, surgery, or obstetric science, must be matriculated in medicine, and must have completed two years in arts and four years in medical studies.

**DIPLOMA IN MEDICINE.**—The medical course and examination necessary for the diploma in medicine are the same as for the degree of M. B., except that the candidate is not required to attend the lectures on botany and comparative anatomy, nor to pass the previous medical examination in those subjects. A diplomate in medicine, on completing his course

\* Existing graduates in medicine of the standing of M. D. are not required to attend

in arts, and proceeding to the degree of B. A., may become a Bachelor in Medicine by attending the lectures on botany and comparative anatomy, passing the previous medical examination in these subjects, and paying the degree fee. Fee for the *Liceat ad Examinandum*, £5. Fee for the diploma in medicine, £5.

**DIPLOMA IN SURGERY.**—The surgical course and examination necessary for the diploma in surgery are the same as for the degree of Bachelor in Surgery. Fee for the *Liceat ad Examinandum*, £5. Fee for the diploma in surgery, £5.

**DIPLOMA IN OBSTETRIC MEDICINE.**—The course and examination for the diploma in obstetric science are the same as that for the Bachelor in Obstetric Science. Fee for the diploma in obstetric science, £1.

N. B.—Each candidate having completed the prescribed courses of study, passed the requisite qualifying examinations in medicine, surgery, and midwifery, and had conferred on him the corresponding degrees, will obtain from the Senior Proctor a diploma entitling him to be entered on the Register of Medical Practitioners under the Medical Act, 1886.

## ROYAL UNIVERSITY OF IRELAND.

All degrees, honors, exhibitions, prizes, and scholarships in this University are open to students of either sex. Candidates for any degree in this University must have passed the matriculation examination. Students from other universities and colleges are included in this rule.

The following degrees, etc., are conferred by the University in this Faculty:—Bachelor of Medicine, Doctor of Medicine, Bachelor of Surgery, Master of Surgery, Bachelor of Obstetrics, Master of Obstetrics; in sanitary science, a special diploma; in mental disease, a special diploma.

The medical examinations, except that for the diploma in sanitary science, will be held twice yearly—viz., in April and in October. The examination for the diploma in sanitary science will be held in July.

The course of degrees in medicine, etc., is of at least four years' duration. Students who have commenced their medical studies since January 1, 1885, must furnish evidence of having been registered by the medical council as students in medicine for at least forty-five months before being admitted to the final examination for M. B. No one can be admitted to a degree in medicine who is not fully twenty-one years of age. All candidates for these degrees are, in addition to attending the lectures and complying with the other conditions to be from time to time prescribed, required to pass the following examinations:—The matriculation examination, the first university examination, the first examination in medicine, the second examination in medicine, the third examination in medicine, and the examination for the medical degrees.

**The First Examination in Medicine.**—Students may not be admitted to this examination until the lapse of two academical years from the time of their matriculation. They must also have previously passed the first university examination. The subjects of this examination are: Natural philosophy, chemistry, zoology, and botany. The examination in each subject will comprise two parts: (1) A written examination; (2) practical work and oral examination. For chemistry the practical examination takes place at the close of the second year. Particular weight will be given to the practical part of the examination. Candidates at the first examination in medicine who at the first university examination in arts did not obtain 30 per cent. of the marks assigned to French or German will be required to present themselves for a qualifying examination in French or German. Failure to obtain 30 per cent. of the marks assigned to either of those languages will involve the loss of the examination.

**The Second Examination in Medicine.**—Students will be admitted to this examination after the lapse of one academical year from the time of passing the first examination in medicine, provided they have completed the first period of the course of medical studies. The subjects for this examination are anatomy, physiology, materia medica (pharmacology), and practical chemistry.

**The Third Examination in Medicine.**—Students will be admitted to this examination after the lapse of one academical year from the time of passing the second examination in medicine, provided they have completed the third year of medical studies. The subjects for this examination will be anatomy and physiology.

**The Examination for the Medical Degrees.**—Students will be admitted to this examination after the lapse of one academical year from the time of passing the third examination in medicine, provided they have completed the course of medical studies prescribed for the fourth year. The examination consists of three parts or divisions: (a) medicine, including therapeutics and pathology; mental diseases; medical jurisprudence; and hygiene. (b) surgery, theoretical, clinical, operative; surgical anatomy, with ophthalmology and otology. (c) midwifery and gynecology, with diseases of children. Each part of this examination must be passed as a whole. Upon completing satisfactorily his examination in all three divisions, the candidate will, in addition to the parchment diplomas recording his admission to the medical degrees of M. B., B. Ch., and B. A. O., receive a certificate of having passed a qualifying examination in the subjects of medicine, surgery, and midwifery. The fee for this certificate is £10, which must be paid prior to the candidate's admission to the medical degrees.

**DOCTOR IN MEDICINE.**—Candidates may be admitted to this degree after the lapse of three academical years from the time of obtaining the degree of M. B. Provided, however, that all persons who were students in medicine in the Queen's University at the date of its dissolution shall be entitled, if they so desire, to be admitted to the degree of M. D., instead of the degree of M. B., upon passing the examination herein prescribed for the M. B. degree. Every candidate will be examined at the bedside, and required to diagnose at least three medical cases, and prescribe treatment, and to write detailed reports on at least two cases to be selected by the examiners, and to discuss all the questions arising thereon.

**MASTER IN SURGERY.**—This degree will be conferred only on graduates in medicine of the University. The examination for this degree will comprise surgical diseases and surgery, both theoretical and operative; surgical anatomy, ophthalmology and otology; and will include—(a) a written examination; (b) a clinical examination; (c) an examination on surgical instruments and appliances; (d) an examination in operative surgery.

**THE MASTER IN OBSTETRICS.**—This degree will be conferred only on graduates in medicine of the University. The examination will comprise the theory and practice of midwifery and of diseases of women and children, and the use of instruments and appliances; and will include—(a) a written examination; (b) a clinical examination as far as practicable; (c) an oral examination, with practical illustrations; (d) an examination on instruments and appliances.

**DIPLOMA IN SANITARY SCIENCE.**—This diploma will be conferred only on graduates in medicine of the University. The examination will include the following subjects:—physics, climatology, chemistry, geology, sanitary engineering, hygiene, sanitary law, and vital statistics. Proficiency in practical work and adequate acquaintance with the instruments and methods of research which may be employed for hygienic investigations are indispensable conditions of passing the examination.

#### ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The diploma of member of this College is not now granted apart from the license of the Royal College of Physicians, except to students who commenced their professional studies prior to October 1, 1884. It does not seem necessary, therefore, to reproduce the regulations of the College at the present date. Students of such standing as to be subject to them may obtain copies on application to the Secretary of the Examining Board in England, or they may refer to *The Lancet*, second volume for 1888, where they will be found fully set out on pages 474 and 475. Students of a later date will be subject to the regulations issued by the Joint Examining Board of the two Royal Colleges of Physicians and Surgeons.

#### ROYAL COLLEGE OF PHYSICIANS OF LONDON.

The license of this College is no longer granted by itself, except to students who commenced professional study prior to the October 1, 1884, and consequently it is no longer necessary to publish the regulations. Any student who registered before the date in question can obtain a copy of the regulations on application to the Secretary of the Examining Board in England, or may refer to them in *The Lancet's* students' number for 1889.

#### EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

*Regulations relating to the several Examinations applicable to Candidates who commenced their Professional Education on or after the 1st of October, 1884.*

Any candidate who desires to obtain both the license of the Royal College of Physicians of London and the diploma of member of the Royal College of Surgeons of England is required to comply with the following regulations, and to pass the examinations hereinafter set forth. Every such candidate who shall commence professional study on or after October 1, 1884, will be required, at the times prescribed for the respective examinations, to produce satisfactory evidence—1. Of having been registered as a medical student by the General Medical Council. 2. Of having been engaged in professional studies at least forty-five months, during which not less than three winter sessions and two summer sessions shall have been passed at one or more of the medical schools and hospitals recognized by the two Colleges. 3. Of having received instruction in the following subjects: (a) Chemistry, including chemical physics; (b) practical chemistry; (c) materia medica; (d) pharmacy. 4. Of having performed dissections at a recognized medical school during not less than twelve months. 5. Of having attended at a recognised medical school—(a) a course of lectures on anatomy during not less than six months, or one winter session; (b) a course of lectures on general anatomy and physiology during not less than six months, or one winter session; (c) a separate practical course of general anatomy and physiology during not less than three months. 6. Of having attended at a recognised medical school—(a) a course of lectures on medicine during not less than six months, or one winter session; (b) a course of lectures on surgery during not less than six months, or one winter session; (c) a course of lectures on midwifery and diseases peculiar to women during not less than three months; (d) systematic practical instruction in medicine, surgery, and midwifery; (e) a course of lectures on pathological anatomy during not less than three months; (f) demonstrations in

the post-mortem room during the whole period of attendance on clinical lectures; (g) a course of lectures on forensic medicine during not less than three months. 7. Of having attended, at a recognised hospital or hospitals, the practice of medicine and surgery during three winter and two summer sessions. 8. Of having attended at a recognised hospital or hospitals, after he has passed the second examination, during nine months' clinical lectures on medicine, and during nine months' clinical lectures on surgery, and of having been engaged during a period of three months in the clinical study of diseases peculiar to women. 9. Of having discharged, after he has passed the second examination, the duties of a medical clinical clerk during six months, and of a surgical dresser during other six months, of which, in each case not less than three months shall have been in the wards. 10. Of having performed operations on the dead subject to the satisfaction of his teacher. 11. Of having received instruction in the practice of vaccination.

**PROFESSIONAL EXAMINATIONS.**—There are three professional examinations, called herein the first examination, the second examination and the third or final examination, each being partly written, partly oral, and partly practical. These examinations will be held in the months of January, April, July and October, unless otherwise appointed. Every candidate intending to present himself for examination is required to give notice in writing to Mr. F. G. Hallett, Secretary of the Examining Board, Examination Hall, Victoria Embankment, W. C., fourteen clear days before the day on which the examination commences, transmitting at the same time the required certificates.

The subjects of the first examination are—chemistry, chemical physics, materia medica, pharmacy, elementary anatomy and elementary physiology. A candidate may take this examination in three parts at different times, or he may present himself for the whole at one time. A candidate will be admitted to the examination on chemistry and chemical physics, materia medica and pharmacy, on producing evidence of having been registered as a medical student by the General Medical Council, and of having received instruction in chemistry, materia medica and pharmacy; or he may take materia medica and pharmacy as part of the second examination; but he will not be admitted to the examination on elementary anatomy and elementary physiology earlier than the end of his first winter session at a medical school, or than the completion of his first six months' attendance at a recognized medical school during the ordinary sessions—i.e., exclusive of the months of April, August and September. A candidate rejected in one part or more of the first examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and he will be re-examined in the subject or subjects in which he has been rejected. Any candidate who shall produce satisfactory evidence of having passed an examination for a degree in medicine on any of the subjects of the first and second parts of this examination conducted at a University in the United Kingdom, in India, or in a British Colony, will be exempt from examination in those subjects in which he has passed.

The subjects of the second examination are anatomy and physiology. A candidate is required to present himself for examination in anatomy and physiology together until he has reached the required standard to pass in one or other of these subjects; but no candidate will be allowed to pass in one of the subjects without obtaining at the same time at least half the number of marks required to pass in the other subject. A candidate will be admitted to the second examination after the lapse of not less than six months from the date of his passing the first examination, on producing evidence of having completed, subsequently to registration as a medical student, eighteen months of professional study at a recognized medical school or schools, and of having complied with the regulations prescribed in Section I., clauses 4 and 5. A candidate rejected in either part or in both parts of the second examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and will be re-examined in the subject or subjects in which he has been rejected.

The subjects of the final examination are: Medicine, including therapeutics, medical anatomy and pathology; surgery, including surgical anatomy and pathology; midwifery and diseases peculiar to women. A candidate may present himself for examination in these three subjects or parts separately or at one time. A candidate will be admitted to the third or final examination on producing evidence—(1) of being 21 years of age; (2) of having passed the second examination; and (3) of having studied medicine, surgery, and midwifery, in accordance with the regulations prescribed in section I., clauses 2 and 6 to 11. The colleges do not admit to either part of the third or final examination any candidate (not exempted from registration) whose name has not been entered in the Medical Students' Register at least forty-five months, nor till the expiration of two years after his having passed the second examination. A candidate rejected in the third or final examination, or in one or more of the three parts into which he may have divided it, will not be admitted to re-examination until after the lapse of a period of not less than six months from the date of rejection, and he will be re-examined in the subject or subjects in which he previously failed to pass. Any candidate who shall have obtained a colonial, Indian or foreign qualification which entitles him to practice medicine or surgery in the country where such qualification has been conferred, after a course of study and examination equivalent to those required by the regulations of the two colleges, shall, on production of satisfactory evidence as to age and proficiency in vaccination, be admissible to the second and third examinations.

The fees for admission to the third or final examination are as follows: For the whole examination, £15 15s; for re-examination after rejection in medicine, £5 5s; for re-examination after rejection in surgery, £5 5s; for re-examination after rejection in midwifery, £3 3s.

**Notice.**—A candidate referred at the second examination in either or both subjects is required before being admitted to re-examination, to produce a certificate that he has pursued, to the satisfaction of his teacher or teachers, in a recognized place of study, his anatomical and physiological studies, or his anatomical or physiological studies as the case may be, during a period of not less than three months subsequently to the date of his reference.

A candidate referred on the third or final examination, or on one or more of the three parts into which he may have divided it, will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and will be required, before being admitted to re-examination, to produce a certificate in regard to medicine and surgery, of having attended the medical and surgical practice or the medical or surgical practice as the case may be, at a recognized hospital during the period of his reference; and in regard to midwifery and diseases of women, a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognized teacher.

Any candidate who withdraws from a part or parts of an examination for which he has sent in his name will not be admissible to such part or parts until the expiration of six months, without the special permission of the Committee of Management.

## ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH, AND FACULTY PHYSICIANS AND SURGEONS OF GLASGOW.

These colleges have made arrangements by which, after one series of examinations, held in Edinburgh or in Glasgow, the student may obtain the diplomas of the three co-operating bodies.

The three co-operating bodies grant their single qualifications only to candidates who already possess another and opposite qualification in medicine or surgery, as the case may be. Copies of the regulations for the single qualification of any of the bodies may be had on application to the respective secretaries.

**PROFESSIONAL EDUCATION.**—1. Candidates must have been engaged in professional study during forty-five months from the date of registration as medical students by the General Medical Council, which period shall include not less than four winter sessions' attendance at a recognized medical school. 2. The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Anatomy, one course, during at least six months; practical anatomy, twelve months; chemistry, one course, six months; practical or analytical chemistry, one course, three months; materia medica, one course, three months; physiology, one course, six months; practice of medicine, one course, six months; clinical medicine, nine months; principles and practice of surgery, one course, six months; clinical surgery, nine months; midwifery and the diseases of women and children, one course, three months; medical jurisprudence one course, three months; pathological anatomy, one course, three months. The six months' courses delivered in Scotland must consist of not fewer than 100 lectures. The three months' courses must consist of not fewer than 50 lectures. The number of lectures certified as attended at any school not situated in Scotland should not be less than three-fourths of the total number of lectures delivered in a course. 3. The candidate must also produce the following certificates: (a) Of having attended not less than six cases of labor, three of these to be conducted personally under the direct superintendence of the practitioner who signs the certificate, who must be a registered medical practitioner. It is, however, strongly recommended that, where opportunity is given, the candidate should either attend for three months the in-door practice of a lying-in hospital, or attend personally not less than twenty cases of labor, and that at least the first six of these cases should be attended under the direct supervision of the practitioner. (b) Of having attended for three months, instruction in practical pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of a class of practical pharmacy. (c) Of having attended for twenty-four months the medical and surgical practice of a public general hospital, containing on an average at least eighty patients, and possessing distinct staffs of physicians and surgeons. (d) Of having attended for six months (or three months, with three months' hospital clerkship) the practice of a public dispensary specially recognized by any of the co-operating authorities; or the out-patient practice of a recognized general hospital, or of having acted for six months as a pupil to a registered practitioner who either holds such a public appointment, or has such opportunities of imparting practical knowledge as shall be satisfactory to the co-operating authorities; this attendance should be made after the student has passed the first and second examinations. (e) Of having been instructed by a registered medical practitioner in the theory and practice of vaccination, and of having performed operations under the teacher's inspection during a period of not less than six weeks.

Candidates are also recommended, when opportunities are afforded, to attend courses of practical or tutorial clinical instruction in medicine, surgery and gynecology; lectures on ophthalmic, aural and mental diseases; also on natural history and comparative anatomy, practical instruction in the use of the microscope and its applications to physiology and medicine, and clinical instruction in a fever hospital.

Candidates will be subjected to three professional examinations, herein called the first examination, the second examination and the final examination, to be conducted at separate times, partly in writing and partly practically and orally.

*First Examination.*—The first examination will embrace chemistry,\* elementary

\*The examination in chemistry will embrace the following particulars: Chemical physics (meaning thereby heat, light and electricity); the principal non-metallic and metallic elements and their more common combinations; also the leading alcohols, organic acids, ethers, carbohydrates and alkaloids. The candidate will also be examined practically in testing.



anatomy\* and histology,† and will take place not sooner than the end of the first year, including the period of a winter and a summer session. The sum of £5 5s. must be paid to the inspector of certificates for this examination, not later than 4 P. M. of the Friday preceding it, after which no candidate will be entered. In the case of a candidate being unsuccessful at this examination, he will be readmitted to examination after a prescribed interval on payment of £3 3s. if he has failed in all subjects, and £2 2s. if he has gained an absolute pass in one or more subjects at this board. This rule will also apply to any subsequent rejection. Any candidate who shall produce satisfactory evidence of having passed an equivalent examination in any of the subjects of the first examination before any of the boards specified in the Regulations will be exempt from examination in such subject or subjects.

*Second Examination.*—The second examination will embrace anatomy, physiology, materia medica and pharmacy, and will not take place before the termination of the summer session of the second year of study, including two winters and two summers. The sum of £5 5s. must be paid to the inspector of certificates for this examination, not later than one week before the day of examination, after which no candidate will be entered. In case of failure, the candidate will be readmitted to examination after the expiry of the prescribed period, on payment of £3 3s. if he has failed in all subjects, and £2 2s. if he has obtained credit at this board for one or more subjects. Any candidate who shall produce satisfactory evidence of having passed in any of the subjects of the second examination before any of the boards specified in the Regulations will be exempt from examination in such subject or subjects; but no examination before such boards will be recognized as giving exemption unless it is coextensive in its scope with the equivalent examination of this board, and is the only or the final examination on the subject or subjects required by the board at which it was passed. When the candidate has not paid the fee of the first examination to this board, his fee payable in respect of the second examination shall be £10 10s.

*Final Examination.*—The final examination will embrace the principles and practice of medicine (including therapeutics, medical anatomy and pathology); clinical medicine; the principles and practice of surgery (including surgical anatomy and surgical pathology); clinical surgery; midwifery and gynecology; medical jurisprudence, and hygiene; and shall not take place before the termination of the full period of study. The fee payable for this examination, which in the case of candidates who have passed the first and second examinations will be £15 15s., must be paid to the inspector at Edinburgh or Glasgow, as the case may be, not later than one week prior to the examination day, after which no candidate will be entered. In case of a candidate being unsuccessful at this examination, £10 10s. shall be returned to him, the remaining £5 5s. being retained to meet the expense of conducting the examination. This rule will also apply to any subsequent rejection. Any candidate admitted to the final examination, on the footing of having passed in the subjects of the first and second examinations at a recognized board, shall, on entering, pay the full fee of £26 5s.; and in the event of his being unsuccessful, £15 15s. will be returned to him at his first and £21 at every subsequent rejection. Candidates will not be exempted from examination in any of the subjects of the final examination, though some of them may have formed part of examinations passed before other boards.

Any graduate in medicine of a British or Irish University, and any graduate or licentiate in medicine of any recognized universities and colleges in India and the British colonies, who has passed at his university an examination or examinations as comprise the subjects of the first and second examinations of this board, and who has completed not less than four years' medical study, including all the subjects of the curriculum, is admissible to the final examination. Any candidate so admitted shall pay a fee of twenty-five guineas at the time of entering for the examination. The sum of £20 will be returned to unsuccessful candidates.

There are six periods of examination annually, four in Edinburgh and two in Glasgow, and candidates may present themselves at either examining centre irrespective of the place of the previous examination. The registrar in Edinburgh is Mr. J. Robertson, 1 George square; and the registrar in Glasgow, Mr. A. Duncan, 242 St. Vincent street, to whom fees and certificates must be sent.

---

\*Elementary anatomy will embrace: Anatomy of the bones and joints of the whole body and of the muscles, chief bloodvessels, and nerves of the upper and lower extremities.

†Histology will be held to include a knowledge and recognition of the morphological elements and structures of skin, bone, cartilage, fibrous tissue, hair, nails, teeth, blood, muscle, nervous tissue, and the appearance and distribution of all the different forms of epithelium, along with a general knowledge of the properties of cells. The examinations of the subject will be oral and practical.

## ROYAL COLLEGE OF PHYSICIANS AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

Two sets of regulations are at present in force, under which examinations take place for the conjoint diploma of these bodies. The older regulations, under which students who commenced their studies before October 1, 1889, may be examined, have appeared in the Students' Number of the *Lancet* in previous years; see pp. 477 and 478 of the second volume of 1888. The following regulations are obligatory on all students commencing on or after the date already mentioned:

**PRELIMINARY EXAMINATION AND REGISTRATION.**—Every candidate for the conjoint examinations of the colleges shall produce evidence—(a) of having, before entering on medical studies, passed a preliminary examination in general education recognized by the General Medical Council; and (b) of having been registered by that council as a student in medicine. Each candidate before receiving his diploma must produce a registrar's certificate or other satisfactory evidence that he has attained the age of twenty-one years.

*Preliminary Examination.*—The subjects of examination are identical with those prescribed for the preliminary examination by the General Council of Medical Education and Registration, except that it includes the additional subject physics, which may be passed at the preliminary examination or at a subsequent supplemental examination, at an extra fee of £1 ls. In no case can physics be deferred to the first professional examination.

**PROFESSIONAL EXAMINATIONS.**—Every candidate is required to pass four professional examinations, one at the end of each year of his professional studies. No candidate shall be admitted to the final or qualifying examination within three months of his rejection at the final or qualifying examination by any other licensing body. All examinations shall be conducted as far as possible by demonstration of objects placed before the candidates.

*First Professional Examination.* Every candidate is required, before admission to the first professional examination, to produce evidence—(1) of having passed in the subjects of the preliminary examination, including physics; (2) of having been registered as a medical student by the General Medical Council; and (3) of having attended in winter a course of (a) lectures on practical anatomy, (b) demonstrations and dissections, and (c) lectures on theoretical chemistry, (d) practical chemistry, three months' summer course, (e) practical pharmacy—(1) evidence of attendance for three months in the compounding department of a clinical hospital, which hospital shall have satisfied the committee of management that its means of instruction are sufficient, and shall return to the committee the names of its students at the commencement of the course, together with a record of their attendance at its close; or (2) evidence of attendance on a course of practical pharmacy in a recognized medical school, the course to consist of not less than twenty demonstrations; or (3) evidence of having served a full apprenticeship of three years, or of having acted as paid assistant for not less than one year in the establishment of a licentiate apothecary or of a registered pharmaceutical chemist.\* The fee for this examination is £15 15s. The subjects of the first professional examination are the following: 1. Chemistry: Elementary chemistry—Inorganic and organic, as found in Roscoe's *Lessons on Elementary Chemistry*,—with a practical examination in the laboratory. 2. Anatomy: Bones, with attachments of muscles and ligaments—joints. 3. Pharmacy: Practical pharmacy, dispensing of drugs, methods of administration of medicines, reading of prescriptions.

*Second Professional Examination.*—Every candidate is required, before admission to second professional examination, to produce evidence of having passed the first professional examination; also certificates of having, in his second or a later year of professional study, attended—(1) A medico-chirurgical hospital for nine months, together with evidence of having taken notes to the satisfaction of the physicians or surgeons in charge of the cases, and certified under their hands, of at least three medical cases and three surgical cases, in the wards of a recognized medico-chirurgical hospital. (2) Courses of lectures as follows:—Winter courses: Practical anatomy; demonstrations and dissections. Summer courses (three months): Histology; materia medica. The fee for this examination is £10 10s. The subjects of the second professional examination are the following:—1. Anatomy: The anatomy of the whole human body. 2. Histology. 3. Hospital practice: Methods of physical diagnosis; application of urinary tests; general principles of the treatment of fractures, of dislocations, of wounds, and of hæmorrhages; bandaging; general principles of case-taking. 4. Physiology; circulation; respiration; digestion. 5. Materia medica. Candidates are examined on three separate days.

*Third Professional Examination.*—Every candidate is required, before admission to the third professional examination, to produce evidence of having passed the second professional examination; also certificates of having, in his third, or a later, year of professional study attended—(1) A medico-chirurgical hospital for nine months, or acted for six months as resident pupil, together with evidence of having taken notes to the satisfaction of the physicians and surgeons in charge of the cases, and certified under their hands, of at least three medical cases and three surgical cases in the wards of a recognized medico-chirurgical hospital. (2) Courses of lectures as follows:—Winter courses: Demonstrations and dissections; medicine; surgery; physiology. Summer course (three months): Medical jurisprudence. The fee for this examination is £9 9s. The subjects for the third professional examination are the following:—1. Anatomy; surgical anatomy. 2. Surgery: Surgery as in the second professional examination; also inflammation, with its varieties and consequences; fractures; dislocations; injuries, mechanical, chemical, physical—their immediate and remote effects; hernia; surgical diseases of blood vessels; diseases of bones; diseases of joints; pyæmia; septicæmia. 3. Medicine: Medicine as in the second professional exam-

\* Licentiate apothecaries and licentiates of the Pharmaceutical Societies of Great Britain and Ireland are exempt from attendance on practical pharmacy.

ination; also diseases of the heart and circulatory system, of the respiratory apparatus, of the abdominal cavity, of the skin; the exanthemata; and the continued fevers. 4. Physiology.

**Fourth and Final Professional Examination.**—Every candidate is required, before admission to the final examination, to produce evidence—(1) of having passed the third professional examination; (2) of having in his fourth or a later year of professional study (a) attended a medico-surgical hospital for nine months as extern pupil, or acted for six months as resident pupil, unless a certificate to that effect has been accepted in the third year; (b) \* a winter course of lectures on midwifery. Certificates will also be required—(1) Of having attended a recognized midwifery hospital or maternity for six months in the winter or summer of the fourth year, with evidence of having been present at thirty labors. (2) Of having for not less than three months, in either the third or fourth year, studied fever in a recognized clinical hospital containing fever wards, and recorded from daily personal observation at least five cases of fever to the satisfaction of the attending clinical physician, as attested by his signature. For the purposes of this regulation the word "fever" is held to include the following diseases only—viz.: typhus, typhoid or enteric fever, scarlet fever, small-pox, and measles. (3) Of having attended a course of operative surgery in the summer session of either the third or the fourth year. (4) Of having attended, at a recognized ophthalmic and aural hospital, or at a recognized ophthalmic and aural department of a general hospital, clinical lectures on ophthalmic and aural surgery during a period of three months. The fee for this examination is £6s. The subjects for the fourth or final examination are the following—1. Medicine. 2. Surgery. 3. Therapeutics. 4. Pathology. 5. Midwifery and diseases peculiar to women. 6. Forensic medicine in reference to medicine, surgery, and midwifery; hygiene. 7. Ophthalmic and aural surgery.† Candidates may present themselves for examination in *all* the subjects of the final examination at the *same* term; or, at one term, in medicine, including therapeutics and pathology, and clinical medicine; at a second term, in surgery, including therapeutics and pathology, ophthalmic and aural surgery, clinical surgery, and operations; at a third term, midwifery, gynecology, forensic medicine, and hygiene. Candidates must pay the full fee before being admitted to any part of the examination. Candidates may take the groups in any order they please. No candidate will receive any diploma till the entire examination is completed.

**REFECTIONS AND RE-EXAMINATIONS.**—Candidates at the first, second and third professional examinations get credit for each subject in which they pass. In any subject in which they fail to pass they are "referred."

**Immediate re-examination.**—Candidates who pass in all subjects but one at the first, second or third professional examination may, with the consent of the examiners on that subject, be re-examined in the same, if the Court of Examiners consider them deserving. The Court of Examiners decide at their conference whether or not a re-examination is to be granted, and if granted it will be held as soon as may be before the term examination is concluded.

**Subsequent re-examination.**—Candidates who have been referred must present themselves at a subsequent examination in the subjects in which they have failed, but must satisfy the examiners in the same before proceeding to the examination of the year.

In the case of candidates so referred, the examiners are authorized to consider for what period, and in what subjects, each candidate is to be referred back to his studies, and to make a recommendation accordingly to the committee of management, who may authorize the re-examination of the candidate at such examination as they may think fit. The examiners are also empowered to recommend to the committee of management, in the case of candidates so referred, whether or not they should be allowed to continue attendance on lectures and obtain certificates as required for the next professional examination.

**EXEMPTION OF CANDIDATES UNDER THIS SCHEME.**—The following exemptions have been agreed to by the committee: Primary examination, Royal College of Surgeons, England, exempts from first, second and third examinations of conjoint scheme, provided that the candidate passes an examination in theoretical chemistry, pharmacy and materia medica, in addition to the subjects of the final professional examination. Second medical examination, Royal University of Ireland, exempts from first examination of conjoint scheme, with the exception of an examination in pharmacy. M. B. Examination, Royal University of Ireland, exempts from first, second and third examinations of conjoint scheme.

**EXEMPTIONS OF CANDIDATES UNDER FORMER SCHEMES.**—I. (a) Candidates who have passed the first professional examination, as hitherto conducted by the College of Surgeons, may present themselves for the second professional examination under the conjoint scheme; (b) candidates who have passed the second professional examination of the College of Surgeons may present themselves for the third examination under the conjoint scheme; (c) candidates who have passed the third professional examination of the College of Surgeons may present themselves for the fourth or final examination under the conjoint scheme. Provided that in each case the candidate shall have complied with the regulations laid down under the conjoint scheme for the examination at which he is about to present himself. But in the case of students registered as such prior to June 1, 1887, the committee of inspection shall have power to vary the regulations when special circumstances shall appear to warrant it.

\* On and after July 1, 1891, a certificate of having attended a course of lectures on pathology will be required in addition to the above named lectures.

† Students who commenced study before July, 1879, are exempt from both the certificate for study and the special ophthalmic examination, but are liable to be examined by the surgical examiners in ophthalmic surgery. Those who commenced before February, 1882, are exempt from the special examination, on producing the certificate of three months' clinical ophthalmology required before that date. Those who commenced after February, 1882, must pass the special examination.

II. Candidates who have passed the first half of the professional examination at the College of Physicians or at the College of Surgeons under the old scheme may present themselves for the final examination under the conjoint scheme, provided they have complied with the regulations under the conjoint scheme for that examination.

III. The Committee of Inspection shall have power to exempt from certain examinations under the conjoint scheme candidates who previously to July 1, 1887, would be exempt from equivalent examinations at the College of Physicians or College of Surgeons, under the regulations of the college as existing prior to the operation of the conjoint examination scheme. Provided that in each case the candidate shall have complied with the regulations laid down under this conjoint scheme for the examination at which he is about to present himself.

#### SOCIETY OF APOTHECARIES OF LONDON.

Every student purposing to study medicine must previously pass a preliminary examination in arts qualifying for registration as medical student. Such examination is held quarterly in the hall of the society on the first Friday and following day in March, June, September and December, and is conducted by means of printed papers. Candidates will be examined in English, Latin, mathematics, elementary mechanics, and one of the following subjects at the option of the candidate: Greek, French, German, logic, botany and elementary chemistry. The subjects may be passed at one or more examinations, and no subject in which a candidate has passed before any examining body recognized by the Medical Council need be taken up again for the purpose of registration. Notice must be sent to the Secretary, with the fee of 1 guinea a fortnight prior to the day of examination. Medical study before registration as medical student is not recognized, with the exception of chemistry, materia medica, pharmacy and dispensing. Candidates can present themselves for examination in special subjects; the fee for each special subject is 1 guinea. A pass-list is published and sent to every candidate.

The examinations to be passed for the diploma in medicine, surgery, and midwifery, which is registrable under the provisions of the Medical Act, 1886, are primary and final, all being written, oral, and practical. The primary examinations are held quarterly on the first Wednesday and on the Monday and Thursday of the same week in the months of January, April, July, and October. The final examinations are held monthly, and consist of—(1) the examination in surgery on the second Wednesday and the following days; (2) the examination in medicine and midwifery on the third Wednesday and on the Monday and Thursday of the same week. The course of medical study must extend over four years, and not less than three winter and two summer sessions must be passed at a recognized hospital and school of medicine. Candidates intending to present themselves for examination must give fourteen days' notice. A form for the purpose will be sent on application. The fee must be forwarded at the same time, with all required certificates, to the Secretary. The entire fee for the examinations is £10 10s., which in the event of failure is not returned. A fee of £3 3s. is required for every re-examination.

The course of study required to qualify for the primary examinations is as follows:—Lectures on chemistry and chemical physics, not less than six months; practical chemistry, three months; materia medica, three months; pharmacy and dispensing, three months, instruction in which must be given by a registered medical practitioner, by a member of the Pharmaceutical Society, or in a public hospital, infirmary, or dispensary. Evidence of having received instruction in these subjects before registration as medical student will be received. The first of the primary examinations may be passed at any period after registration. The second includes anatomy, physiology and histology; to qualify for this examination the candidate must have received instruction in anatomy, not less than six months; practical anatomy with demonstrations, twelve months; physiology, six months; histology with demonstrations, three months. Candidates will be excused any or all of the subjects of the primary on producing evidence that they have passed equivalent examinations before an examining body recognized by the Medical Council. Both examinations of the primary may be passed the same evening.

To qualify for the final examinations the following course of study must be observed: Hospital practice, surgical and medical, with post-mortem examinations, not less than three winter and two summer sessions. No hospital is recognized for this purpose which is not in connection with an established medical school. Lectures on the principles and practice of surgery, six months; practical surgery, three months; clinical surgical lectures, nine months; surgical dresser, three months; lectures on the principles and practice of medicine, six months; pathology, three months; clinical medical lectures, nine months; medical clinical clerk, three months; forensic medicine, hygiene and insanity, three months; lectures on obstetric medicine, including gynecology, three months; clinical instruction in the same, three months; a course of practical midwifery; attendance on twenty midwifery cases. The offices of dresser and clinical clerk may be discharged at a hospital, infirmary or dispensary where sufficient opportunities are afforded for the acquirement of practical knowledge.

The above form the subjects of the final examinations, which cannot be passed before the expiration of forty-five months after the registration as medical student. There is no exemption from any portion of the final examinations. The first of the final examinations includes the principles and practice of surgery; an examination of surgical cases; surgical pathology; surgical anatomy and operative manipulation, and surgical instruments and appliances. The second includes an examination of medical cases, and, besides the subjects named, a microscopic examination of morbid structures, and obstetric instruments and appliances. The following certificates must be produced prior to the final examinations: 1. Certificate of birth. The candidate must be twenty-one. 2. Certificate of moral character. 3. Certificate of the course of medical study, which must be signed by the dean of the medical school or other authority. A schedule for this purpose to be obtained at the Hall. 4. Certificate of proficiency in vaccination, signed by a teacher recognized by the Local

The examination for a certificate to act as assistant in compounding and dispensing medicines is held the fourth Wednesday of every month, and will be as follows: In translating and dispensing prescriptions; in the British Pharmacopœia; in materia medica and botany; in pharmacy and pharmaceutical chemistry. A week's notice must be given, with the fee of 2 guineas.

## ROYAL COLLEGE OF SURGEONS, IRELAND, AND THE APOTHECARIES' HALL OF IRELAND.

Every candidate for the conjoint diplomas is required to pass a preliminary examination and four professional examinations.

*First Professional Examination.*—Candidates will be required, before admission to the first professional examination, to produce evidence—1. Of having been registered by the Medical Council as medical students at least nine months before examination. 2. Of having attended (a) practical anatomy, (b) chemistry, (c) demonstrations and dissections, (d) practical chemistry, (e) physics, (f) practical pharmacy for three months in the compounding department of a clinical hospital, or a school of pharmacy, or in the compounding establishment of a licentiate apothecary. The fee for this examination is £12 12s. Candidates will be examined on physics, chemistry and anatomy (osteology).

*Second Professional Examination.*—Candidates must produce evidence of having passed the first professional examination; also certificates of having subsequently attended—(a) a medico-chirurgical hospital for nine months, and of having taken notes of at least three medical cases and three surgical cases, or a certificate of clinical clerkship; (b) the following courses of lectures: (1) Demonstrations and dissections; (2) physiology; (3) surgery, winter courses, six months; (4) materia medica; (5) practical physiology, including histology, summer courses, three months. The fee for this examination is £7 7s. Candidates will be examined in anatomy, physiology, materia medica and pharmacy.

*Third Professional Examination.*—Candidates must produce evidence of having passed the second professional examination; also certificates of having subsequently attended—(a) a medico-chirurgical hospital for six months as resident pupil, or for nine months as extern pupil, and, in the latter case, notes of at least three medical and three surgical cases, or of having acted as clinical clerk at any period; (b) the following courses of lectures: (1) Demonstrations and dissections; (2) medicine; (3) midwifery and diseases peculiar to women, in winter courses (may be deferred to the fourth year); (4) pathology\*; (5) medical jurisprudence, forensic medicine, and hygiene, in summer course. The fee for this examination is £7 7s. Candidates will be examined in anatomy, surgery, medicine, and medical and surgical pathology.

*Fourth Professional Examination.*—The candidate must produce evidence—(1) Of having been registered as a medical student by the Medical Council at least forty-five months previously; (2) of having passed the third professional examination; (3) of having subsequently attended—(a) a medico-chirurgical hospital for nine months as extern pupil, or six months as resident pupil; (b) lectures on midwifery, a winter course (unless taken in the third year); (c) a recognized midwifery hospital, or maternity, for six months in the winter or summer of either the third or the fourth year, with evidence of having been present at thirty labors; (d) of three months' study of fever in a clinical hospital containing fever wards, and of having taken notes of at least five cases of fever (attendance at a fever hospital will not be recognized if concurrent with that on practical midwifery); (e) operative surgery in the summer session of either the third or fourth year; (f) clinical lectures in ophthalmic and aural surgery (three months) at a recognized ophthalmic hospital, or at an ophthalmic department of a general hospital. The fee for this examination is £7 7s. Candidates will be examined in medicine, therapeutics, surgery, midwifery and diseases peculiar to women, ophthalmic and aural surgery, and forensic medicine and hygiene.

## THE ARMY, NAVY, AND INDIAN MEDICAL SERVICES.

Admission into the Army and Indian medical services is gained as the result of competitive examination. Under special conditions, the admission may take place by nomination of the Secretary of State for War. Candidates for both services must, before being admitted to examination, possess the double qualifications to practice medicine and surgery, and be registered under the medical act, and must also furnish satisfactory certificates of moral character. Candidates for the army must be between the ages of twenty-one and twenty-eight, in good health and both parents of unmixed European blood; for the Indian service, between twenty-two and twenty-eight, of sound bodily health, and natural born subjects of Her Majesty. Both are examined as to physical fitness by a board of Medical officers. These conditions being satisfied, the candidate is admitted to the competitive examination, which is usually held in London twice a year, in the months of February and August. The subjects of examination are divided into *compulsory* and *voluntary*. The former comprises anatomy and physiology, surgery, medicine, including therapeutics and the diseases of women and children, chemistry and pharmacy, and a practical knowledge of

\*The certificates in pathology will not be required until further notice.

drugs. The eligibility of the candidate for admission into the service is determined by the result of this part of the examination. The *voluntary* subjects are French, German, comparative anatomy, zoology, natural philosophy, physical geography, and botany, with especial reference to *materia medica*, and for the Indian service *Hindustani*. Although the results of the examination on voluntary subjects do not affect the question of the eligibility of the candidate for a commission, they influence his position on the lists, which is determined by the numbers obtained under the two heads conjointly. After having passed this examination, the successful candidates for both services are sent to the Army Medical School at Netley as "surgeons on probation" with the rank of lieutenant, receiving a daily pay of 8s, and certain allowances, to go through a four months' course of instruction in the special duties required of them in the service. The staff of the school consists of four professors, all of them men of acknowledged ability and high standing in their special departments. The professorship of military medicine is Deputy Surgeon-General Henry Cayley. Surgeon-General Sir T. Longmore, Kt., C. B., is professor of military surgery; Surgeon-Major J. L. Notter, M. D., of military hygiene; and Sir W. Aitken, F. R. S., of pathology. To each of these an army medical officer is attached as assistant professor. The lectures on military surgery include gunshot and other wounds, transport of sick and wounded, duties of army medical officers in the field, on board troopships and transports, recruiting, and other surgical duties incident to military service. Those on military medicine treat of tropical and other diseases to which soldiers are exposed in the course of their service, the mortality and invaliding by disease, in peace and war, at home and abroad, management of lunatics under the conditions of military service, &c. The course of hygiene comprises the examination of water and air, the general principles of diet, with the quality and adulterations of food and beverages, the sanitary requirements of barracks, hospitals, and camps, the clothing, duties, and exercises of the soldiers, and the circumstances affecting his health with the best means of preventing disease, and instruction in the mode of preparing the various statistical and other returns required of the medical officer. The surgeons on probation are detailed for duty in the wards of the hospital, under the professors and assistant professors of medicine and surgery. Here they are taught practically the details of the management of patients in a military hospital, the registration of their diseases, the duties of invaliding, the modes of filling up the regulation statistical returns and other service documents. The surgeons on probation are provided with quarters, and are members of the excellent mess established at Netley. After having passed through the course of instruction they are examined on the subjects taught in the school, and their position on the list recommended for commissions is determined by the combined results of the competitive and final examinations. At the close of each session five prizes are awarded: the Herbert prize of £20 to the surgeon on probation who has obtained the highest number of marks at the London and Netley examinations conjointly; the Parkes memorial bronze medal to the one who gains the highest number of marks in the examination on hygiene at Netley, combined with those given for the answers to a special question set on the same subject; the Martin memorial gold medal to the highest number of marks in the final examination on military medicine, with the addition of those gained for a special question connected with it; the Montefiore gold medal and £21, awarded in the same manner for military surgery; and the Montefiore second prize, consisting of works on military surgery, to the surgeon on probation who obtains the second highest number in this branch.

The surgeons of the British medical service at the close of the Netley courses of instruction pass on to Aldershot, where they go through a systematic course of instruction in ambulance drill and equitation. The surgeons of the Indian medical service, who do not go to Aldershot, undergo, while at Netley, a special course of instruction in ambulance drill and duties. Surgeons are promoted to be surgeons-major on completing twelve years' full pay service, of which three must have been abroad. Before being promoted they will be required to pass an examination. This examination is intended to test the progress and proficiency of a surgeon in all those branches of knowledge which are essential to his continued efficiency as a medical officer, and may be taken at any time after his seventh year of service. The examination in medicine and surgery will be held by two gentlemen appointed by the Secretary of State; that in hygiene by the professor of hygiene, Army Medical School, Netley; and that in regulations, duties, military law, &c., by an administrative medical officer, nominated for the purpose by the Director-General.

The examination will embrace the following subjects: *a.* Surgery and surgical anatomy. *b.* Medicine and pathology. *c.* Hygiene, within the limits treated of in "Parkes' Practical Hygiene;" also the regulations regarding the sanitation of garrisons, quarters, hospitals, etc., as well as of camps and hospitals in the field, and of transports, troops and hospital ships. *d.* Duties of medical officers at home and abroad, and at sea, as defined in regulations; also hospital organization and administration in peace and war, including the transport of sick and wounded by land and sea. *e.* The administration, interior economy, command and discipline of the medical staff corps, together with a knowledge of the principles of military law and their practical application (unless a certificate of proficiency in military law has been obtained at a garrison class.)

A certificate will be required from a recognized teacher of surgery in any medical school, at home or abroad, in which operative surgery is taught, showing that the medical officer has gone satisfactorily through a complete course of operative surgery during the period within which the examination must be taken, and that he is a competent operator.

A report on any subject of a practical professional character, to be selected by the officer himself, and certified to be his own composition and in his own handwriting, will also be required. Considerable importance will be attached to the literary and scientific merits of this report. The examinations will be conducted by printed questions, which will enter so far into the subject matter of each head selected for examination as to show that the officer's knowledge has been fully tested. The questions and answers will be forwarded, under a sealed confidential cover, to the Director-General, for transmission to the examiners, who will report to the Director-General as to the competence of the officer examined. Any higher qualification, such as M. D., F. R. C. S., etc., or any diploma in hygiene and state medicine, taken after the date of publication of these regulations, will not exempt sur-

The selection of surgeon-major for advancement to the grade of brigade-surgeon is made on the grounds of ability and merit, in determining which the following points will be considered: The officer to be so selected must have been favorably reported on by the several military and departmental officers under whom he may have served, as set forth in their annual confidential report. He must be physically fit for general service, and have the necessary qualifying foreign and Indian service under existing rules. The examination tests for promotion to this grade have been discontinued.

Brigade surgeons, to be eligible for selection as deputy surgeons-general, must have served abroad at least ten years, of which three must have been in India. All officers under the rank of deputy surgeon-general are placed on the retired list at the age of fifty-five, and those of that rank and surgeons-general at the age of sixty, except that in any particular case in which it may be considered necessary for the interest of the public service to keep a surgeon-general on full pay, the age of retirement may be extended to sixty-two.

The regulations above noted, respecting the promotion of surgeons and surgeons-major are equally applicable to the Indian medical service, except that a surgeon may be promoted to the rank of surgeon-major at less than twelve years' service, should the Secretary of State for India, on the recommendation of the Viceroy, consider such promotion to be for the good of the service.

The conditions of admission into the Naval Medical Service are the same as those for the Army; but the candidate is also required to declare his readiness to engage for general service, and to proceed on duty abroad whenever required to do so. After having passed the competitive examination in London the successful candidate will receive a commission as surgeon in the Royal Navy, "and will undergo a course of practical instruction in naval hygiene at Haslar Hospital."

Surgeons are promoted to staff surgeons after twelve years from the date of entry, provided they pass the requisite examination; and staff surgeons to fleet surgeons after twenty years' service, if recommended by the Director-General. Deputy inspectors-general are promoted by selection from the fleet surgeons, and inspectors-general from the deputy inspectors-general having three years' foreign, four years' mixed, of which not less than two have been abroad, or five years' home service in such appointments as preclude foreign service provided they have not refused to go abroad when called upon to do so. Inspectors and deputy inspectors-general are retired compulsorily at sixty, and other grades at fifty-five years of age, and all ranks at any time if they have not served for five years. In calculating service for retired pay, time on half-pay will be taken as equivalent to one-third service on full-pay.

## INSTITUTIONS THAT DO NOT GRANT DEGREES.

### I. SCHOOLS HAVING A COMPLETE CURRICULUM.

1. St. Bartholomew's Hospital and College, London.
2. Charing Cross Hospital and College, London.
3. St. George's Hospital, London.
4. Guy's Hospital, London.
5. King's College and Hospital, London.
6. London Hospital and College, London.
7. St. Mary's Hospital, London.
8. Middlesex Hospital, London.
9. St. Thomas Hospital, London.
10. University College and Hospital, London.
11. Westminster Hospital, London.
12. London School of Medicine for Women, London.
13. Queen's College, Birmingham, England.
14. Bristol School of Medicine, Bristol, Eng.
15. Cambridge University, Medical School, Cambridge.
16. Leeds School of Medicine, Leeds, Eng. (Medical Department of Yorkshire College.)
17. University of Durham, College of Medicine, Newcastle-upon-Tyne, Eng.
18. University College, Liverpool. (*Affiliated to Victoria University.*)
19. Owens College (Victoria University), School of Medicine, Manchester.
20. Sheffield School of Medicine, Sheffield.
21. Aberdeen University. School of Medicine, Aberdeen, Scotland.
22. Edinburgh University, School of Medicine, Edinburgh, Scotland.
23. School of Medicine, Edinburgh, Scotland.
24. Glasgow University, School of Medicine, Glasgow, Scotland.

25. St. Mungo's College and School of Medicine, Glasgow, Scotland.
26. Anderson's College Medical School, Glasgow, Scotland.
27. Glasgow Western Medical School, Glasgow, Scotland.
28. Dublin University Medical School, Dublin, Ireland.
29. Dublin Royal College of Surgeons, Dublin, Ireland.
30. Ledwich School of Medicine and Surgery, Dublin, Ireland.
31. Carmichael College, Dublin, Ireland. (Formerly Richmond Hospital Medical School.)
32. Catholic University, Dublin, Ireland.
33. Queen's College School of Medicine, Belfast, Ireland.
34. Queen's College School of Medicine, Cork, Ireland.
35. Queen's College, Galway, Ireland.

## II. INSTITUTIONS HAVING AN INCOMPLETE CURRICULUM,

*(Including Ancillary Schools of Medicine),*

These are, as a rule, open to advanced students and practitioners of medicine.

### A. INSTITUTIONS IN LONDON.

1. Bethlem Hospital, London.
2. HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, BROMPTON.—Lectures and clinical demonstrations are given throughout the year by members of the medical staff.
3. CENTRAL LONDON THROAT AND EAR HOSPITAL.—A course of lectures on the special diseases treated is delivered during the winter months.
4. Royal Hospital for Children and Women.
5. HOSPITAL FOR WOMEN.—A course of lectures on the anatomy and physiology of the female pelvic organs is given during each quarter.
6. MR. THOMAS COOKS' SCHOOL OF ANATOMY, PHYSIOLOGY, SURGERY, ETC.—By decision of the Royal Colleges of Physicians and Surgeons, gentlemen rejected at the anatomical and physiological examinations (primary R. C. S., or second conjoint) can get "signed up" from this school for the three or six months' work they are now required to put in before re-examination. This school is intended to meet the requirements of two classes of students:—1. Qualified practitioners and advanced students—i. e., gentlemen wishing either to obtain some of the higher qualifications, or to compete for appointments in Her Majesty's Army, Navy, and Indian Medical Services. 2. Students preparing for the usual primary and pass examinations of any of the licensing bodies. The instruction is given on the dissected and undissected body, with normal and pathological specimens, microscopical preparations, chemical, physiological and surgical apparatus, splints, etc. The school possesses a good collection of physiological apparatus, allowing of the demonstration to the class of the great bulk of the usual practical exercises in physiology; also chemical apparatus, allowing every student not only to see, but to repeat for himself, the analysis of the principal food stuffs, and fluids and solids of the body, and also all the usual reaction tests, etc. Gentlemen preparing for the higher examinations receive special instruction in the more difficult subjects, and have the advantage of personally repeating the practical exercises in physiology above alluded to. The operations of surgery are performed by the students on the dead body. Private address: 40, Brunswick square.
7. DENTAL HOSPITAL OF LONDON MEDICAL SCHOOL.—Lectures on mechanical dentistry, dental surgery and pathology, and on dental anatomy and physiology (human and comparative.)
8. Royal Hospital for Diseases of the Chest.
9. Royal Ear Hospital.
10. Great Northern Central Hospital.
11. London Temperance Hospital.
12. National Hospital for the Paralyzed and Epileptic.
13. QUEEN CHARLOTTE'S LYING-IN-HOSPITAL AND MIDWIFERY TRAINING SCHOOL.—Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—upwards of three-fourths of the total admissions. Clinical instruction is given on the more important cases which present themselves. Certificates of attendance at this hospital are recognized by all universities, colleges and licensing bodies. Midwives and monthly nurses are trained. The midwives are specially prepared for the examination of the Obstetrical Society.
14. Seamen's Hospital, Greenwich.
15. Hospital for Sick Children.



16. **ROYAL LONDON OPHTHALMIC HOSPITAL.**—Classes, lectures and demonstrations periodically.

17. **ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.**—Special demonstrations and lectures during the session.

18. **Royal Orthopædic Hospital.**

19. **ST. PETER'S HOSPITAL FOR STONE AND URINARY DISEASES.**—A course of lectures upon urinary diseases is delivered every year by members of the staff, whilst clinical instruction in the wards and out-patient department is given daily throughout the year, except on Friday. The attendance of practitioners and senior students is invited.

20. **THE COLLEGE OF STATE MEDICINE, London.**—The objects of the college, which was founded in 1886 and incorporated in 1887, are (a) to found, establish, and maintain in or near London an institution to aid the theoretical and practical investigation and study of sanitary science and of all matters relating thereto; (b) to aid the theoretical and practical investigation and study of other branches of State Medicine; (c) with a view to effecting these objects, to appoint professors, to institute lectures and demonstrations, to issue publications of the transactions of the Association, and to found chemical and pathological laboratories and a library; (d) to do all such other things as may from time to time be incidental or conducive to the attainment of the objects above set forth or any of them. The importance and necessity of such an institution have been forcibly impressed upon the notice of the council—(1) by the increasing demand for public health qualifications; (2) by the fact that possession of such a diploma is of great value to army medical officers, as it gives exemption to this subject in the qualifying examinations for promotion; (3) that the possession of such a diploma is, in accordance with the provisions of the County Government Act, compulsory in the future upon those seeking appointments as medical officers of health. Further particulars as to the courses of lectures, etc., may be obtained from the Honorable Secretary at the College, Great Russell street, Bedford Square.

21. **VOLUNTEER MEDICAL STAFF CORPS (LONDON DIVISION), 62, St. Martin's Lane.**—Hon. Commandant: Surgeon-General Sir William Guyer Hunter, K. C. M. G., M. P., Q. H. S. Commandant: Surgeon-Major A. T. Norton. The Volunteer Medical Staff Corps bears the same relation to the Volunteer Army as the Medical Staff Corps bears to the Regular Army. The course of training has the great advantage of affording, in addition to a knowledge of ordinary military duties, special ambulance instruction useful in all ranks of life. All who have gone through the ranks of this corps are capable of rendering valuable aid in any accident, and in cases of emergency may be the means of saving lives which would otherwise be lost. In addition to the company and battalion drills of an ordinary infantry corps, the special training includes stretcher, wagon, and litter drill; the use of improvised seats and stretchers; the use and application of bandages, splints, etc.; lectures by the officers on first aid to the injured, and on the elements of anatomy, physiology, hygiene, and nursing. Lectures are delivered during the winter session.

22. **SCHOOL OF PHARMACY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.**—Lectures on subjects relating to pharmacy.

23. **SOUTH LONDON SCHOOL OF PHARMACY, LIMITED.**—Lectures on subjects relating to pharmacy. In addition, lectures on practical toxicology and forensic medicine.

24. **Middlesex College of Chemistry and Pharmacy.**

25. **NORMAL SCHOOL OF SCIENCE AND ROYAL SCHOOL OF MINES.**—Biology, chemistry and physics taught.\*

## B. PROVINCIAL INSTITUTIONS.

26. **MASON COLLEGE, Birmingham.**—This College is associated with Queen's College, Birmingham, for the purpose of medical education, all students of the latter college attending in the physical, chemical, zoological, botanical, and physiological departments of Mason College.

27. **BRISTOL ROYAL INFIRMARY.**—Dressers reside in the house in weekly rotation, and have charge of all casualties under the supervision of the house surgeon. Special instruction (including dresserships) for first-year students in the out-patient department. Class instruction in the wards by the physicians and surgeons on five days a week, in addition to the regular clinical lectures. Special departments for diseases of women, the eye, ear, etc., with clerkships and dresserships attached. One or two pathological clerks are appointed every four months, who perform all post-mortem examinations.

28. **BRISTOL GENERAL HOSPITAL.**—Special clinical instruction is given in diseases of the skin, eye, ear, and throat; also in diseases of women and in dental surgery.

29. **ADDENBROOKE'S HOSPITAL, Cambridge.**—Clinical lectures in medicine and surgery, in connection with the Cambridge Medical School, are delivered at this hospital twice a week during the academical year; and practical instruction in medicine and surgery in the

---

\* LONDON POST-GRADUATE COURSE; established 1890. Three courses of eight weeks' duration each were held in 1890, at which 121 practitioners attended. The lectures were given at various hospitals by forty-five lecturers. The president is Mr. Jonathan Hutchinson, and the Secretary Dr. Fletcher Little.—(*Lancet*, January 3, 1891.)

wards and out-patients' rooms is given by the physicians and surgeons daily, during the vacations as well as term time. Instruction is also given in all the special modes of medical and surgical investigation. Clinical clerks and dressers are selected from students according to merit, and without payment.

**30. ROYAL INFIRMARY, Newcastle-upon-Tyne.**—Clinical lectures are delivered by the physicians and surgeons in rotation. Pathological demonstrations are given as opportunity offers by the pathologist. Practical midwifery can be studied at the Newcastle Lying-in Hospital. Instruction is given in psychological medicine at the Coxlodge Lunatic Asylum. A special course of instruction is given in the city hospital for infectious diseases by the superintendent, the city officer of health, Mr. H. E. Armstrong.

**31. LEEDS GENERAL INFIRMARY.**—The Leeds General Infirmary has accommodation for 320 in-patients, surgical and medical, and during the last year 4,428 in-patients and 30,985 out-patients were treated. Clinical teaching takes place daily in the wards, and clinical lectures are given in the operating-room. There are medical, surgical, ophthalmic, aural, and electrical departments, in each of which special instruction is imparted to students. A gynecological and extern obstetric department, together with laryngeal and skin clinics, are in operation. The Public Dispensary, the Hospital for Women and Children, the Fever Hospital, and the West Riding Lunatic Asylum are other medical institutions which are made use of by the Leeds students.

**32. MANCHESTER ROYAL INFIRMARY.**—To this are attached a fever hospital, an asylum for the insane and a convalescent home. Medical and surgical clinical classes are conducted in the infirmary, and separate instruction is afforded in the elements of medical and surgical physical diagnosis, in obstetric medicine, ophthalmic surgery, and pathological anatomy by the different members of the staff of the Medical School and Infirmary.

**33. RADCLIFFE INFIRMARY, Oxford.**—This infirmary is open to students for medical and surgical work in the wards and out-patients' departments. Clinical lectures given by the Litchfield Clinical Lecturers in Medicine and Surgery. Also tutorial instruction and demonstrations are given in special regional anatomy (medical and surgical), methods of medical diagnosis, and surgical manipulation. Practical pharmacy is taught in the infirmary dispensary. The whole course of study at the museum and infirmary combined is intended for students until they have passed the second conjoint examination or the first Oxford M. B.

**34. SHEFFIELD INFIRMARY.**—Has a museum of pathology, library, and post-mortem theater, with microscopes, and all the appliances for clinical research. The Public Hospital and Dispensary contains 101 beds, and is recognized by the examining bodies.

**35. JESSOP HOSPITAL FOR WOMEN, Sheffield.**—The hospital is devoted to diseases peculiar to women. There is also an obstetric department for the admission of a small number of cases. Students can attend the practice of the hospital, and be supplied with cases of midwifery.

**36. BATH ROYAL UNITED HOSPITAL.**—Recognized by the Royal College of Physicians, Surgeons, etc., and licensed for dissections.

**37. DEVON AND EXETER HOSPITAL, EXETER.**—Attendance on the practice of this hospital qualifies for all the examining boards. Arrangements can be made by which students can attend cases of midwifery.

**38. WEST OF ENGLAND EYE INFIRMARY, EXETER.**—Students of the Exeter Hospital can attend the practice of the Eye Infirmary.

**39. LIVERPOOL NORTHERN HOSPITAL.**—There is a special ward for the treatment of children. Clinical lectures are delivered by the physicians and surgeons during the summer and winter sessions. Clinical clerkships and dresserships are open to all students without additional fee.

**40. LIVERPOOL ROYAL SOUTHERN HOSPITAL.**—Clinical lectures are given by the physicians and surgeons during the winter and summer sessions. Clinical clerkships and dresserships are open to all students. Special wards for accidents and diseases of children. Resident students received.

**41. NEW ROYAL INFIRMARY, LIVERPOOL.**—Excellent facilities for clinical and pathological study.

**42. NORFOLK AND NORWICH HOSPITAL.**—Resident and non-resident pupils received.

**43. NORTHAMPTON GENERAL INFIRMARY.**—Out-pupils are received, and have every opportunity of acquiring a practical knowledge of their profession. Instruction is also given in anatomy and materia medica and practical pharmacy.

**44. NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, HARTSHILL.**—Has children's wards, special ovarian wards, and a special department for the treatment of diseases of the eye. The attendance of pupils at this infirmary is duly recognized by all the examining boards; and there are unusual facilities for acquiring a practical knowledge of the profession.

**45. WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.**—A preparatory school of medicine and surgery. The pupils have the advantage of seeing the whole of the practice of the physicians and surgeons, and are trained in clinical work by the medical and surgical staff. The attendance of pupils at this hospital is recognized by all the examining boards.

## C. SCOTTISH INSTITUTIONS.

47. **EDINBURGH SCHOOL OF MEDICINE AND PHARMACY.**—Chemistry, theoretical and practical midwifery, surgery, and medicine are taught. From the dispensary attached to this institution, pharmacy, practical and theoretical. Practical midwifery, out-door practice, medical and surgical diagnosis. Attendance at this institution qualifies for the University of Edinburgh and all other licensing boards. Tutorial classes in all the branches of the medical curriculum.

48. **ROYAL INFIRMARY, GLASGOW.**—Hospital practice, clinical instruction, pathology and vaccination.

49. **WESTERN INFIRMARY, GLASGOW.**—Hospital practice, clinical instruction, pathology and vaccination.

50. **OPHTHALMIC INSTITUTION, GLASGOW.**—Instruction in diseases of the eye.

51. **GLASGOW WESTERN MEDICAL SCHOOL.**—Lectures and demonstrations are given on surgery, on practice of physics, on midwifery and gynecology, on diseases of the ear, throat and nose, on diseases of the eye, and on public health. Clinical instruction at the Western Infirmary.

52. **UNIVERSITY COLLEGE, Dundee.**—This College now forms part of St. Andrews' University. Its classes therefore qualify for this and for all the other Scottish universities. Didactic and laboratory instruction in natural history, botany, operative surgery, chemistry, anatomy, and physiology.

53. **ROYAL INFIRMARY, Dundee.**—Clinical, practical, and post-mortem instruction.

54. **ROYAL ASYLUM, Dundee.**—Clinical instruction.

55. **ROYAL INFIRMARY, Edinburgh.**—Beds are set apart for clinical instruction by the professors of the University of Edinburgh. Courses of clinical medicine and surgery are also given by the ordinary physicians and surgeons. Special instruction is given in the medical department on diseases of women, physical diagnosis, and on diseases of the skin; and in the surgical department on diseases of the eye, the ear, the larynx, and the teeth. Separate wards are devoted to venereal diseases, diseases of women, diseases of the eye, also to cases of incidental delirium or insanity. Post-mortem examinations are conducted in the anatomical theatre by the pathologists, who also give practical instruction in pathological anatomy and histology. No fees are paid for any medical or surgical appointment. The appointments are as follows:—1. Resident physicians and surgeons are appointed, and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Special non-resident clerks are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dpeasers are appointee by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the pathological department are appointed by the pathologists.

56. **EDINBURGH EYE, EAR, AND THROAT INFIRMARY, Edinburgh.**—Clinical lectures and instruction are given. Those whose diseases require operations or more than ordinary care are accommodated in the house.

57. **GLASGOW HOSPITAL AND DISPENSARY FOR DISEASES OF THE EAR.**—Operations and special demonstrations.

58. **GLASGOW WESTERN INFIRMARY.**—Special wards are set apart for diseases of women and for affections of the skin. In the out-patient department there are special clinics for diseases of women and for diseases of the throat, ear and teeth. The clinical courses are given by the physicians and surgeons, each of whom conducts a separate class, and students may attend whichever they select at the beginning of the session. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. In the pathological department the course is both systematic and practical, and extends through the winter and following summer. Eight resident assistants are appointed annually, without salary, from those who have completed their course.

59. **ROYAL HOSPITAL FOR SICK CHILDREN, Glasgow.**—Clinical instruction. Students taken.

60. **GLASGOW OPHTHALMIC INSTITUTION.**—Clinical and systematic course of lectures for students during the winter and summer seasons.

61. **ABERDEEN ROYAL LUNATIC ASYLUM.**—Clinical instruction for three months in summer.

**ABERDEEN ROYAL INFIRMARY.**—Clinical instruction in medicine, surgery and ophthalmology. Instruction in pathology.

## D. IRISH INSTITUTIONS.

63. **ADELAIDE MEDICAL AND SURGICAL HOSPITALS, Dublin.**—Instruction in clinical medicine, surgery, obstetrics, medical and surgical pathology, gynecology, ophthalmology and pathological histology.

64. **COOMBE LYING-IN HOSPITAL AND GUINNESS DISPENSARY FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN, Dublin.**—The hospital contains 65 beds, and has also a large extern maternity attached. Nearly 3000 confinements are attended annually by the pupils of the hospital. A special dispensary for diseases peculiar to women is held daily, and clinical instruction given. The certificates of the hospital are recognized by all licensing bodies, and its diploma is accepted by the Local Government Board, etc.

65. **SIR PATRICK DUN'S HOSPITAL.**—The hospital is open to extern students as well as to the students of Trinity College, and the certificates are recognized by all the licensing bodies in the kingdom.

66. **MATER MISERICORDIE HOSPITAL, Dublin.**—This hospital, the largest in Dublin, at present containing 300 beds, is open at all hours for the reception of accidents and urgent cases. Fifty beds are specially reserved for the reception of patients suffering from fever and other contagious diseases. Instruction at the bedside will be given by the physicians and surgeons daily. A course of clinical instruction on fever will be given during the winter and summer sessions. A certificate of attendance upon this course, to meet the requirements of the licensing bodies, may be obtained. Opportunities are afforded for the study of diseases of women in the ward under the care of the obstetric physician and at the dispensary. Ophthalmic surgery will be taught in the special wards and dispensary. Surgical operations are performed four days a week. Connected with the hospital are extensive dispensaries, which afford valuable opportunities for the study of general medical and surgical diseases, accidents, etc. Instruction is given on pathology and bacteriology. Eight resident pupils are elected from the most attentive of the class to hold office for six months. Dressers and clinical clerks will be appointed, and certificates will be given to those who perform their duties to the satisfaction of the staff.

67. **RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS, Dublin.**—These hospitals contain 312 beds—110 for surgical cases, 82 for medical cases, and 120 for fever and other epidemic diseases. Clinical instruction.

68. **ROTUNDA HOSPITAL, Dublin.**—This institution consists of two distinct hospitals—the Lying-in Hospital and the Auxiliary Hospital, the latter for the reception of patients suffering from uterine and ovarian diseases. There is also a large extern maternity and a dispensary for diseases peculiar to women. Clinical instruction is given daily (Saturdays excepted) in midwifery and the diseases peculiar to women, special attention being directed to the application of antiseptics in midwifery, and lectures on these subjects are delivered regularly throughout the session. Accommodation is provided for a limited number of intern pupils.

**DR. STEEVEN'S HOSPITAL, Dublin.**—There is a ward entirely devoted to syphilitic disease, a detached building for fever cases, and an extensive out-patient department, with separate clinics for diseases of the skin, throat, eye, ear and teeth. Clinical lectures are given by the physicians and surgeons during the session. There is accommodation in the hospital for two medical and six surgical resident clinical assistants. Affords exceptional advantages for clinical instruction.

## PRELIMINARY EDUCATION IN FOREIGN COUNTRIES.\*

As the subject of the preliminary education of medical students has recently been under discussion in various quarters, it may not be unprofitable to glance at the systems and requirements of foreign countries as regards this matter.

In order that some kind of a comparison may be made between foreign and British examinations, we give the programme of the Medical Council now in force for the preliminary examination. The subjects are: 1. English language, including grammar and composition. 2. Latin, including grammar, translation from specified authors, and translation of easy passages not taken from such authors. 3. Mathematics, (a) arithmetic, including vulgar and decimal fractions, (b) algebra, including simple equations, (c) geometry, including the first book of Euclid, with easy questions on the subject matter of the same. 4. Elementary mechanics of solids and fluids, comprising the elements of statics, dynamics, and hydrostatics. (This subject may be postponed until the next examination.) 5. One of the following optional subjects: (a) Greek, (b) French, (c) German, (d) Italian, (e) any other modern language, (f) logic, (g) botany, (h) zoology, (i) elementary chemistry. The above is of course the minimum, and is represented more or less accurately by such examinations as that held by the Apothecaries' Hall and by the second class College of Preceptors' examination. About half of the total number of students who register annually have passed an examination of this class.

A large number of medical students, however, pass an arts examination of a somewhat higher class, of which the matriculation examination of the University of London or the senior local examinations of Oxford or Cambridge may be taken as types. The subjects for the London matriculation are—1. Latin; translation from selected authors and of easy passages from other books, grammar, and easy sentences to be translated into Latin. 2. One other language: Greek, French, German, Sanskrit, or Arabic—grammar, and translation into English only. 3. English language, English history, and the geography relating

\* From the London *Lancet*, September 6, 1890, and Börners' "Reichs-Medicinal-Kalendar," 1889.

thereto. 4. Mathematics, arithmetic, algebra to quadratic equations, geometry, the subjects of the first four books of Euclid, with deductions. 5. Mechanics, including hydrostatics (elementary). 6. Science: one of the following—(a) chemistry of the non-metals, (b) heat and light, (c) magnetism and electricity, (d) botany. Rather less than 1,000 students present certificates of an examination of this class at registration in each year.

Examinations of a still higher order are now passed by an increasing number of students. In these we may class the B. A. degree of Oxford and Cambridge, and the intermediate B. A. examination in London. The subjects for the latter, which, as will be seen later on, corresponds somewhat with several of the continental minimum examinations for medical students are—1. Latin: translations of selected and non-selected authors, grammar, and short passages to be translated into Latin; Roman history. 2. Greek: grammar, and translation from a short selected author. 3. English language, composition, literature, and history. 4. French or German: grammar and translation into English. 5. Mathematics; arithmetic; algebra to the theory of Indices and Logarithms; geometry, plane and solid, with the elements of coordinate geometry; trigonometry. The number of students who present proof of a preliminary education of this class annually is considerably under 100, though, of course, an appreciable number subsequently pass higher examinations.

It is very difficult to gauge the severity of an examination from a prospectus, however detailed. With regard to the minimum, it may be mentioned as a guide that it is quite commonly passed by boys between fourteen and fifteen of no special ability, and that all the subjects except Latin could be passed by the brighter lads in the seventh standard in many of the London Board Schools. In a few such schools the Latin itself could also be achieved, and it must be remembered that even in the others several subjects are taught, such as geography, religious knowledge, and drawing, which are not required, so that it may fairly be said that a moderately intelligent lad of, say, fourteen years of age, who has passed creditably through a Board School, has as much education as is demanded from a medical student. The question as to the sufficiency of this is discussed in another page. There is no doubt that it is far less than is required by any other European country, most of which insist upon a long school course, finishing up with an examination equivalent to that for the B. A. degree in many universities, and including a greater multiplicity of compulsory subjects than is to be found in the programme of even the London matriculation.

In comparing Continental examinations with British it should be marked that whereas with us the examiners are usually entire strangers to the candidates, abroad pupils are much more commonly examined by their own teachers, with, perhaps, an official or government inspector as a kind of assessor. For this reason the British system is the more difficult and the more uncertain of the two.

In France there are two grades of medical practitioners—viz., *Docteur en Médecine* and *Officier de Santé*. The latter is likely to be abolished shortly. The preliminary education required for the lower grade is very moderate. The examination includes a knowledge of Latin or one modern language; a piece of easy prose composition has to be written and an author translated, the standard expected to be attained being that of "the fourth form." There are also French, arithmetic and algebra, and very elementary chemistry, physics and natural history. This examination is probably about equivalent to the minimum ones in Great Britain. Medical students who propose to take the diploma of *Docteur* are obliged to have had a very superior education, having to possess the degrees of *Bachelier ès Lettres* and *Bachelier ès Sciences* (the latter modified in respect of the mathematical part of the examination). The examinations for the *Bachelier ès Lettres* comprise the subjects taught in the three highest classes of Lycees, corresponding to the fourth, fifth and sixth, or perhaps more nearly to the lower and upper fifth and the sixth forms of an English school. A piece of Latin prose and an essay in German or English are required, a dictionary being allowed for the latter. Candidates are also examined in a number of authors—Greek, Latin and either English or German. There is a good deal of history, geography, and French literature, also arithmetic to square root, algebra to quadratics, geometry (about equivalent to the whole of the Euclid read in England, and a little of Conic Sections), elementary logic and mental and moral philosophy, and elementary chemistry, physics and natural history. Altogether these examinations are stated by those who have had good opportunities of judging to be quite as difficult as the intermediate B. A. of the University of London or as the pass B. A. at Oxford or Cambridge. This, however, is not all, for there is also the *Bachelier ès Sciences* (modified), to pass which includes a considerable amount of chemistry, astronomy (non-mathematical of course), zoology, botany and geology. This examination is said to be at least as difficult as the preliminary scientific examination for the London M. B. It does not, however, take its place, for the first of the five subsequent examinations for the doctorate comprises physics, chemistry and natural history.

In Germany the "leaving" or *Abiturienten* examination is generally looked upon as more formidable than the professional examinations which come after. It must be passed at a classical school or *Gymnasium*, and is conducted by the masters themselves under the control of a Government official or *Schulrath*. The subjects are those taught in the highest class. They are as follows:—1. Classics. A considerable amount of Latin is required; not only a good many authors must be known, but an essay is given and a piece of prose. In Greek a knowledge of several authors, such as Thucydides, Sophocles, and Homer, is expected. 2. One modern language; French is generally taken. Not only are authors given, but composition is required, no dictionary being allowed. 3. German. A very extensive knowledge of the language and literature is necessary. 4. Ancient and Modern History. Here the examination covers very wide ground. 5. Mathematics. This includes arithmetic, algebra to probabilities, and the binomial theorem; geometry, equivalent to the whole of Euclid as read in England, and conic sections; trigonometry. 6. Natural science, including elementary mechanics, astronomy, chemistry, physics, and natural history. 7. Religious knowledge, according to the religion of the candidate's parents—Protestant or Roman Catholic. This examination can be much more fully compared to that for higher certificates conducted by the Oxford and Cambridge Schools' Examination Board than to any of the more public examinations held in Great Britain, such as those of the London

University. It is, however, probably, on the whole, as difficult as the intermediate B. A. and the matriculation examinations taken together, and it certainly requires a much better knowledge of Latin than even the final B. A. examination in London. A boy of moderately good ability who has gone through school satisfactorily is not expected to be able to pass the *Abiturienten Examen* until he is eighteen or nineteen years of age.

In *Austria* the *Maturitätsprüfung* or *Matura* examination, which admits to university matriculation, is passed at a classical gymnasium, and is very similar to the *Abiturienten Examen* in Germany, at least in the German parts of Austria. The course at the gymnasium cannot be commenced before ten years of age, and requires eight years.

In *Russia* the examination at the end of the eight years' public school course is somewhat similar to the German *Abiturienten Examen*; but more stress is laid on modern languages, a thorough knowledge of German and French being required. Both Latin and Greek are necessary, but perhaps not quite to the same extent as in Germany.

In *Italy* a person desiring to commence the study of medicine at any of the numerous universities must show that he has passed through an eight years' course of study at school—that is to say, five years in a *Ginnasio* and three years in a *Liceo*. Both Greek and Latin must be studied, but in the final examination for the *Licenza liceale*, which corresponds somewhat to the French *Baccalauréat de Lettres*, Greek is not compulsory. French, too, is taught in the *Ginnasio*, but not in the *Liceo*, and so does not enter into the final examination. A good knowledge of Latin is required, including several authors and both prose and verse composition. A considerable amount of history, geography and Italian literature is required. In mathematics, algebra is required to logarithms and quadratic equations, Euclid to the sixth book (including the fifth), plane trigonometry and conic sections, also mechanics. In science, elementary physics, chemistry, and natural history are necessary.

In *Switzerland* several Latin authors are required, Livy, Cicero, Virgil, with some parts of Horace, and Plautus. The Greek authors are Homer, Xenophon, and portions of Plato, and Sophocles. Greek may, however, be omitted if English or a third Swiss language is taken. A full examination in the literature of the native language must be passed, and a good knowledge of, with ability to write and speak, a second Swiss language is required. Acquaintance with ancient and modern history with geography is necessary. In mathematics, algebra is required to the binomial with positive indices; also geometry, plane trigonometry, conics, and the rudiments of spherical trigonometry. In addition to these subjects, there is an elementary examination in natural science, embracing mechanical and natural philosophy, chemistry and natural history. This examination may be compared to the matriculation and intermediate B. A. examinations of the University of London taken together.

In *Belgium*, where a satisfactory leaving certificate from school is not produced, a student must pass an examination comprising—1. The principles of rhetoric. 2. Translation into French or Flemish of a Latin author. 3. Translation of a Flemish, German, or English author, at the candidate's choice. 4. An essay in French or Flemish. 5. Arithmetic. 6. Algebra, including progressions and logarithms. 7. Plane geometry, and the elements of geometry of three dimensions. 8. Geography. 9. The history of Belgium. 10. The principal facts of ancient, mediæval and modern history. In addition to these subjects the government may prescribe translation from Greek into French or Flemish.

In *Holland* any one of the following three examinations is accepted—1. The examination for promotion from the fourth to the fifth form of a gymnasium or classical school. 2. The "leaving" examination at the end of a *real* or modern school course. 3. A special examination in modern subjects without Latin or Greek. It will be noticed that Holland is the only country in Europe in which a complete license to practice can be obtained without a knowledge of Latin. A candidate who commences medical study after a non-classical examination can only proceed to the diploma of *Arts* or medical practitioner. For the degree of Doctor of Medicine a classical school must have been gone through.

In *Sweden, Norway, and Finland*, besides the leaving certificate from school, a course of at least a year and an examination in mental and moral science at the University is required before a student is allowed to enter on the study of the sciences preliminary to medicine.

In *Denmark* the *Examen Philosophicum*, which used to be necessary, has now been abolished.

In *Spain* the degree of Bachelor of Letters and Arts is required, and in addition a fuller examination in physics, chemistry, and natural history, together with elementary German. For the *Bachillerato* the subjects required are Spanish, Latin, geography, rhetoric and poetry, arithmetic and algebra, geometry and trigonometry, French, history (general and Spanish), and the rudiments of physics, chemistry, human physiology, and agriculture.

In *Portugal* a six years' course is required, embracing instruction and examinations in Latin, Greek, French, German, mathematics, geography, history, Portuguese literature, drawing and elementary physics, chemistry, natural history, and mental philosophy.

In *Brazil* the candidate for the study of medicine must pass an examination in the natural sciences and in languages.

In *Chili* the candidate must have passed the six years' course in a lyceum for the degree of Bachelor.

In *Cuba* the candidate must hold the Bachelor's degree before beginning the study of medicine.

In *Uruguay* each candidate for the study of medicine must have the title B. Sc. et L., the examination for which corresponds to the German Abiturientenexamen.

## FOREIGN GRADUATION REQUIREMENTS.

[Exclusive of those in Great Britain and Ireland.]

### INCLUDING NAMES OF MEDICAL INSTITUTIONS IN FOREIGN COUNTRIES, AND REQUIREMENTS FOR THE LICENSE TO PRACTICE MEDICINE.

The following information in regard to foreign schools is taken mainly from Dr. Paul Börner's "Reichs-Medicinal-Kalendar," Part II, 1888, edited by Dr. S. Guttman, of Berlin and published by Georg Thieme, Leipzig.

**GERMANY.**—Has twenty medical faculties in the following universities: 1. Friedrich-Wilhelms University in Berlin. 2. Rheinische Friedrich-Wilhelms University at Bonn. 3. University of Breslau. 4. Friedrich-Alexanders University in Erlangen. 5. Albert-Ludwig's University at Freiburg. 6. Ludwig's University at Gießen. 7. Georg-Augusts University at Göttingen. 8. University of Greifswald. 9. Vereinigte Friedrichs University Halle-Wittenberg (University of Halle). 10. Ruprecht-Karls University at Heidelberg. 11. University of Jena. 12. Christian-Albrechts University at Kiel. 13. Albertus University at Königsberg. 14. University of Leipzig. 15. University of Marburg. 16. Ludwig-Maximilians University in Munich. 17. University of Rostock. 18. Kaiser-Wilhelms University in Strassburg. 19. Eberhard-Karls University at Tübingen. 20. Julius-Maximilians University at Würzburg\*.

The following in regard to education and examinations in Germany is taken from Dr. Henry Hun's "Guide to American Medical Students in Europe"; New York: William Wood & Co.

The student who wishes to educate himself for the medical profession, must devote eight semesters to medical study, and must previously have passed through the gymnasium. The first four semesters must be devoted exclusively to physics, chemistry, zoology, botany, mineralogy, anatomy and physiology. At the end of these four semesters the student may pass his first examination (tentamen physicum). With the fifth semester commences his purely medical studies, which must be continued without interruption for two years, and then the student may pass the state examination (Das medicinsche Staatsexamen d. h. die ärztliche Approbationsprüfung). The university examination (Doctor-examine) can be passed either after or before the state examination.

The following is a list of the studies recommended and the number of semesters during which each one should be studied, and also the proper semester in which each should be studied. The first column shows the number of semesters during which the study must be continued; the last column shows the semesters in which it should be studied:

#### *Preparatory Scientific Studies.*

	Semester.
2. Experimental Physics.....	1st and 2d
1. Experimental Chemistry.....	1st or 2d
1. Mineralogy.....	1st or 2d
1. Botany.....	1st or 2d
1. Zoology.....	1st or 2d
1. Organic Chemistry.....	2d or 3d
1. Chemical Exercises (qualitative analysis).....	2d or 3d
1. Chemical Exercises (quantitative analysis).....	3d or 4th

#### MEDICAL STUDIES.

##### *Anatomy.*

1. Osteology and Syndesmology.....	1st
2. General Anatomy of Man.....	1st to 4th
2. Anatomical Dissection.....	1st to 4th
1. Tissues.....	1st to 3d
1. Histology.....	2d to 4th
1. Comparative Anatomy.....	2d to 4th
1. Embryology.....	2d to 4th
1. Topographical Anatomy.....	3d to 6th

##### *Physiology.*

1. General Physiology.....	2d or 3d
1 or 2. Experimental Physiology (1st part).....	2d or 3d
1 or 2. Experimental Physiology (2nd part).....	3d or 4th
1 or 2. Physiological Demonstrations and Exercises.....	3d to 8th
1. Medical Chemistry.....	3d to 8th
1. Medical Physics.....	2d or 3d
1 or 2. Physiological Conference.....	3d to 8th

\*These universities are called by the names of the cities in which they are situated—as the "University of Berlin," or "of Bonn," etc.

*Pathological Anatomy.*

1.	General Pathology and Pathological Anatomy.....	5th or 6th
1 or 2.	Special Pathological Anatomy, 1st part, (including pathological histology).....	5th or 6th
1 or 2.	Special Pathological Anatomy, 2nd part, (including pathological histology).....	6th or 7th
3.	Autopsies.....	6th to 8th
1 or 2.	Practical Work in Pathological Histology.....	7th to 8th

*Internal Medicine.*

2.	Auscultation and Percussion.....	5th to 7th
1.	Materia Medica.....	5th or 6th
1.	Therapeutics.....	5th or 6th
3 or 4.	Medical Clinic and Polyclinic.....	5th to 8th
3 or 4.	Special Pathology and Therapeutics.....	5th to 8th
2.	Diseases of Children and Children's Clinic.....	7th and 8th
1.	Laryngoscopic Course.....	7th or 8th
1.	Electro-therapeutic Course.....	7th to 8th
1.	Insanity.....	7th to 8th
1.	Clinic of Insanity.....	

*Surgery.*

2.	Surgery.....	5th and 6th
2 or 3.	Instruction in Operations, Instruments and Bandaging.....	6th to 8th
3.	Surgical Clinic and Polyclinic.....	5th to 8th
2.	Surgical Operative Course.....	7th and 8th
1.	Course in Bandaging.....	6th or 7th
2.	Diseases of the Eyes.....	7th and 8th

*Obstetrics.*

1.	Obstetrics.....	5th or 6th
3.	Obstetrical and Gynecological Clinic and Polyclinic.....	6th to 8th
1.	Practice in Gynecological Examinations.....	5th or 6th
1 or 2.	Obstetrical Operations.....	7th and 8th
1.	Diseases of Women.....	6th or 7th
1.	Medical Jurisprudence.....	7th or 8th
1.	State Medicine.....	7th or 8th
1.	Hygiene.....	7th or 8th
1.	History of Medicine.....	7th or 8th

The schedule above given is merely recommended and is not at all compulsory. A very similar plan of study is recommended by the University of Berlin.

The state examination can be passed either before the chief examining committee in Berlin or before special examining committees which are annually appointed for the different universities. The application for permission to pass the state examination is to be made either to the Minister of Medical Affairs in Berlin or to the curator of the university at which the student wishes to pass the examination. The application is to be accompanied by certificates that the student has completed a full course of study in the gymnasium and in a university, that he has successfully passed the *Tentamen physicum* and that he has acted as practicum during at least two semesters both in a medical and in a surgical clinic, and that he has attended at least four cases of midwifery in the obstetrical clinic.

The examinations are held at any date between November of one year and July of the next, and the examination of each student extends over many days and is divided into five parts: 1, anatomy, physiology and pathological anatomy; 2, surgery and ophthalmology; 3, medical; 4, obstetrical and gynecological; 5, final examination.

The examination in anatomy is divided into two parts. At the first the candidate draws by lot a question in osteology and another about the viscera, and he must immediately demonstrate the corresponding preparation which is handed to him. He is then given some nervous preparation which he must take away and dissect and demonstrate before the examiners at their second meeting.

In the physiological examination the candidate must draw by lot two questions, one on histology, the other on physiology, and immediately discuss them (orally). He must prepare and demonstrate the histological specimen in the presence of the examiners so as to show his acquaintance with the microscope.

In the pathological examination the candidate must make an autopsy of the whole or at least a part of the body and dictate the results. He must also demonstrate a pathological specimen.

In the surgical examination each candidate must take charge of two patients for a week. In the presence of the examiner he must examine the patient and discuss the etiology, diagnosis, prognosis and treatment. He must write out a history of the case and keep a record of it each day. The candidate must also attend the regular morning visits at least three times during this week and have questions about other cases put to him. At another time he is given a question about some operation and must give an account of the operation and instruments employed, and then perform the operation on the cadaver. He must answer in the same way another question on luxations.

In the ophthalmic examination he must examine a patient with disease of the eye as above described in surgery.



The medical examination is conducted in exactly the same way as was described in the surgical examination. In addition, special attention is paid to the doses of medicine and to the writing of prescriptions.

In the obstetrical examination he is shown a woman in labor and must make the diagnosis of the period of labor, the position of the child, and the prognosis, and must conduct the labor. He must then write out a history of the birth. In addition, during seven days he must examine a number of obstetrical and gynecological cases and discuss them. He must also perform operations on the phantom.

Finally he is subjected to a final oral examination to test his general medical knowledge. The cost of the examination is \$51. The time between the different examinations should not exceed eight days.

In order to pass the University examination it is not necessary to have passed the Tentamen physicum. The application for permission to pass the University must be made to the dean of the medical faculty, and must be accompanied by certificates that the candidate has studied at least six, in some Universities eight semesters, a certificate of good character from the police, and a thesis on some medical subject, and \$106. In some Universities the dean gives the candidate a preliminary examination to see if he is sufficiently well prepared, but in most Universities this is not the custom. If the thesis be satisfactory to the professors then the candidate is allowed to come up for examination. The examination is an oral one, and is held in anatomy, physiology, general pathology, and pathological anatomy, special pathology and therapeutics, surgery, midwifery and gynecology. After the examination the candidate hands in his dissertation. The examination is held before six regular professors, and each examiner examines for about a quarter of an hour. The dissertation is sometimes discussed in public, but more frequently not.

There are two medical diplomas given in Germany, one by the State and the other by the University and each has its separate examinations and requirements; the former being the more difficult of the two. The state recognizes only those doctors who have passed its examination. They alone have a license to practice and they alone can receive appointments to any medical office. Those doctors who have only passed the University examination can hold no appointment, and cannot insist on the payment of their fees from their patients. Any person who chooses, with or without a degree, can practice medicine in Germany, but he does so at his peril, and if he makes any mistakes, he is punished both by fine and imprisonment.

**AUSTRIA.**—Has medical schools in: 1. Karl-Franzens University at Graz. 2. Leopold-Franzens University at Innsbruck. 3. Deutsche-Karl-Ferdinands University in Prague. 4. University of Vienna. 5. University of Buda-Pesthe.\* 6. Klausenburg.\* 7. University of Cracow.\* Methods and regulations the same as in Germany. Foreigners, in order to obtain the license to practice must become Austrian subjects, and pass the state examination.

**SWITZERLAND.**—Four medical faculties, in the Universities of Basle, Berne, Geneva and Zurich. Methods and regulations the same as in Germany. Each Canton has a medical examining board which can confer the license to practice.

**BELGIUM.**—Three years' study in one of the four universities—Ghent, Liege, Brussels and Louvain. Examinations for the degree of M. D. are divided into 3 sections, as follows: 1. General pathology, pathological anatomy, special pathology and therapeutics, general therapeutics. 2. Surgical pathology (including ophthalmology), theoretical midwifery, hygiene, medical jurisprudence. 3. Medical, ophthalmological and surgical clinic, practical midwifery, surgical operations. All the examinations under 3 are practical. According to the new law the Government is authorized, on the advice of a jury, which has the power of granting the diplomas of Doctor of Pharmacist, to give permission to applicants who have obtained a diploma abroad entitling them to practice in their own country, but no permission can be given to practice medicine unless the original diploma authorizes the holder to practice medicine, surgery and midwifery. The Government is, however, authorized to grant to persons, even though they may have no diploma, on the advice of the Medical Commission of the Province in which they reside, special permission to practice "certain acts of the art of healing."

**DENMARK.**—One medical school, in the University of Copenhagen. The examinations for the degree are divided into three parts: 1. *a.* Oral examination in anatomy, physiology and pharmacology; *b.* practical examination in dissections. 2. *a.* Written examination in medical jurisprudence, surgery and therapeutics. *b.* Oral examination in general pathology and pathological anatomy, special pathology and therapy, surgical pathology and midwifery. *c.* Practical examination in clinical medicine, and clinical and operative surgery. Foreigners must pass a severe State examination at the University.

**FRANCE.**—Has six diploma-granting faculties, at Paris, Montpellier, Nancy, Lille, Lyons and Bordeaux. There are in France twenty-one other schools which cannot grant degrees, viz: Two complete schools at Nantes and Marseilles, fifteen preparatory schools at Alger, Amiens, Angers, Besançon, Caen, Clermont-Ferrand, Dijon, Grenoble, Limoges, Poitiers, Rheims, Rennes, Rouen, Toulouse and Tours, three naval medical schools at Brest, Rochefort and Toulon, and the Military Medical School of Val-de-Grâce in Paris. None of these twenty-one schools can grant degrees; their pupils are examined by one of the six faculties. The course of study extends over four years. The examinations for the degree are divided into five sections: 1. Physics, chemistry and the natural history of medicine. 2. *a.* Anatomy, histology and dissection. *b.* Physiology. 3. *a.* Operation course, theoretical surgery, midwifery. *b.* Pathology of internal diseases, general pathology. 4.

\*Austria-Hungary.

**a.** Medical jurisprudence, hygiene, materia medica. **b.** Clinic of internal diseases, pathological anatomy. 5. Dissertation—*a. Thèse*, which must be defended before the faculty. These theses are the result of original work, and are valuable contributions to medical literature. Graduates of foreign schools must pass an examination before one of the six faculties.

**GREECE.**—One university medical school, at Athens. Four courses of study required, at the end of which the theoretical examination is held and one year after this the candidate is examined practically. The practical examination corresponds to the German State Examination, and is necessary for the license to practice. Graduates of foreign schools must pass a State Examination.

**ITALY.**—Has twenty-one medical faculties and schools: Royal Medical Faculties at Bologna, Cagliari, Catania, Messina, Modena, Naples, Padua, Palermo, Parma, Pisa, Rome, Sassari, Siena and Turin; free universities at Camerino, Ferrara, Perugia and Urbino and the Istituto di Studi Superiori Pratici e di Perfezionamento in Florence. All of these grant the degree. The medical course lasts six years, with an examination at the end of each year, and a final examination at the close of the course. In Rome qualified foreign men who confine their practice to their own countrymen are not interfered with, though in order to practice generally, the M. D. of an Italian university must be obtained.

**HOLLAND.**—Has four universities, at Leyden, Utrecht, Groningen and Amsterdam. The right to practice is granted to none but those that pass a severe theoretical and practical examination before a government examining board, and that, after passing this examination, have the care of medical and surgical cases for at least two years, and attend at least ten normal cases of midwifery and two in which artificial delivery must be employed. Foreign medical men must pass a severe state examination in order to practice.

**NORWAY.**—Has one medical school in the Frederik's University of Christiania. The course of study is seven years. The successful passing of the final examinations gives the title "Candidate in Medicine" and the license to practice. To obtain the degree the candidate must defend an original dissertation before faculty. As a rule foreign medical men must pass a severe state examination in order to practice.

**PORTUGAL.**—Has three medical schools, in the universities of Coimbra, Lisbon and Oporto. The medical course is five years, at the end of which the candidate can get a license to practice by passing the examinations. The degree M. D. is granted by the University of Coimbra only. The other schools confer the title surgeon. Foreign medical men who wish to practice in Portuguese territory must pass a state examination (held in the Portuguese language) at one of the medical schools.

**ROUMANIA.**—Has two medical schools, in the Universities of Bucharest and Jassy. The medical course lasts five years; at the end of the course, which is similar to that in Germany, the candidate may obtain the degree and the license to practice medicine by passing the final examination and defending a thesis before the faculty. Foreign medical men wishing to practice must pass a viva-voce state examination.

**RUSSIA.**—Has eight medical schools, in the Medical Military Academy at St. Petersburg and in the Universities of Moscow, Kasan, Charkov, Kieff, Warsaw, Dorpat, and Helsingfors. The medical course lasts five years. The methods of study, of examining, of licensing, and the examinations are practically the same as in Germany. Foreign medical men must pass the State examination in order to practice, unless he holds a foreign M. D. of high value, in which case the Minister of Education may be satisfied with the reading and defending of a dissertation.

**SWEDEN.**—Has three medical faculties, in the Universities of Upsala and Lund, and the Kongl. Karolinska Mediko-Kirurgiska Institutet at Stockholm. The student must complete his general chemistry and physics education before beginning the study of medicine. After passing the examinations in anatomy, physiology, physiological chemistry, pharmacology, general pathology and history of medicine, the candidate must have six months' service in the academy hospital, eight months' service in the Scraphim Hospital at Stockholm, two or three months in the Hospital for Venereal Diseases, four months in the Lying-in Charity, the clinic for women and the Children's Hospital, and two months in the Hospital for the Insane. In from three to five years after passing the examinations mentioned above he can come up for the licentiate examination, the passing of which gives the right to practice. For the M. D. degree the licentiate must defend a dissertation publicly. Foreign medical men must pass a severe state examination in order to practice.

**SPAIN.**—Has nine medical faculties in the Universities of Barcelona, Granada, Madrid, Seville, Salamanca, Santiago, Valencia, Valladolid and Saragossa. The medical course lasts six years. The examinations are similar to those in Germany except that the faculty examination is practical and clinical. After this the candidate must pass the government examination for the Licentiate's degree and one year thereafter a second government examination for the M. D. degree. Foreign physicians wishing to practice must pass a state examination. Some British diplomas are sometimes exempt.

**TURKEY.**—Has two medical schools, the Military and the Civil, at Constantinople. The course is six years, two of which are spent in clinical work. Foreign medical men must pass an examination, the fee for which is £4 10s, in order to practice.

**GAUTEMALA.**—One medical school, in the University of Gautemala. The course is six years, as follows: *First year*—Anatomy, physics, botany. *Second year*—Chemistry, zoology, physiology, anatomy. *Third and fourth years*—General internal and surgical pathology, surgical clinic, operative courses, hygiene, assistance in the surgical clinic. *Fifth year*—Materia medica, medical jurisprudence, obstetrics, pathological anatomy, medi-

clinic. After the second year a part of the course consists in assisting in the medical and surgical clinics. The examination for the license examination is theoretical and practical, two hours on each subject, and the candidate must defend a printed thesis. The M. D. degree can be had by passing examinations at the end of the fifth year and defending a thesis before the State Commission.

**MEXICO.**—Has nine medical schools, four of which—in Mexico, Guanajuato, Gaudalajara and Oaxaca—are government schools, while five—in Pueblo, Yucatan, Zacatecas, Monterey and Campeche—are State institutions. The course of study in each of the schools is six years.

**ARGENTINE REPUBLIC.**—Two medical schools, in Buenos Ayres and Cordova. The course of study is graded and lasts six years. Candidates that fail in the examinations of one course must take that course again. The final examinations are theoretical and practical. After passing these and defending a thesis the candidate receives the M. D. degree, which entitles to practice. Foreign physicians wishing to practice must pass a severe State examination for the license.

**BOLIVIA.**—One medical faculty in the University of Sucre.

**BRAZIL.**—Has two medical faculties, in Rio de Janeiro and Bahia. The course of study is graded and lasts twelve semesters or six years, as follows:

*First Year*—Physics, chemistry, mineralogy, botany and zoology. *Second Year*—Chemistry, histology and descriptive anatomy. *Third Year*—Physiology, pathological anatomy, general pathology, clinical surgery, dermatology and syphilology. *Fourth Year*—Medical and surgical pathology, pediatrics, materia medica and clinical surgery. *Fifth Year*—Obstetrics, topographical anatomy, operation courses, prescription writing, and clinical medicine and ophthalmology. *Sixth Year*—Medical jurisprudence, toxicology, hygiene, history of medicine and clinical medicine, obstetrics, gynecology and psychiatry.

There are examinations at the end of each semester. These examinations are oral, written and practical. After passing all examinations the candidate must defend a dissertation and three theses before the faculty, after which the M. D. degree is conferred. Foreign physicians are licensed only after passing a severe State examination.

**CHILE.**—One medical faculty in the University of Santiago. The course of study is graded and lasts six years, differing but little from that in Brazil. Actual work in the hospital begins in the second year. At the end of the fourth year the bachelor examinations are held. The fifth year is devoted to hygiene, clinical work and operation courses; the sixth year to legal medicine and clinical work, after which the licentiate examinations are held. The above examinations are written and oral. After passing the licentiate examinations the candidate can proceed immediately to the M. D. examination, which consists of an oral part before five examiners and a practical part. This degree examination is in all respects the same as the German Staats-examen. Foreign physicians are licensed only after passing a severe State examination.

**UNITED STATES OF COLOMBIA.**—Have one medical school in the University of Bogota.

**CUBA.**—Has one medical school in the University of Havana. The course of study is six years, at the end of which a State examination is held for the M. D. degree and the license to practice.

**PERU.**—One medical school in the San Marcos University at Lima. The medical schools of the second order at Arequipa, Puno, Cuzco, Truxillo and Ayacucho have been closed since the war with Chili, in 1886, at which time the Chilians plundered the valuable museums, libraries and laboratories. The course of study lasts 7 years, of 9 months each. The Bachelor examinations are held at the end of the 5th year, and the Licentiate examinations at the end of the full course. For the M. D. degree 5 additional examinations must be passed. Foreign physicians are licensed only after passing a severe State examination.

**URUGUAY.**—One medical school in Montevideo. The course of study lasts six months, as follows: *First year*—Medical physics, medical chemistry, medical natural history and anatomy (one course). *Second year*—Anatomy (two courses), physiology and general pathology. *Third year*—Medical pathology (one course), surgical pathology (one course), materia medica, pathological anatomy, and assistance in the medical and surgical clinics. *Fourth year*—Medical pathology (two courses), surgical pathology (two courses), hygiene, pathological anatomy, materia medica and assistance in the medical and surgical clinics. *Fifth year*—Topographical anatomy, operation courses, clinical medicine and surgery, and obstetrics. *Sixth year*—Obstetrical clinic, gynecology, clinical medicine and surgery, pediatrics and ophthalmology. Examinations at the end of each year. At the end of the full course the candidate, by passing the examinations, receives the degree and the right to practice. Clinical work begins in the third year, when each student does duty in the clinics.

**VENEZUELA.**—Two medical schools, at Caracas and Maracaibo. Six years course; examination at the end of each session. The passing of the final examinations entitles to the degree and the right to practice. Each student must do actual clinical work from the second year on.

**SYRIA.**—One medical school at Beyrut. The teachers are Americans. Course of study is four years. Degrees are conferred by the Imperial Medical School at Constantinople.

**INDIA.**—One medical school at Madras. Regulations the same as in Great Britain.

**JAPAN.**—Has one medical faculty in the University of Tokio and 20 medical schools. The course in the University is five years, and is on the plan of the course in Germany. A government examination—like the German Staats-Examen—entitles to practice. Of the 20 medical schools in the Empire there are 16 of the first class and four of the second class. In the former the course is eight semesters—four years. Passing of the final examinations in these entitles to practice. In the latter the course is three years, and candidates are examined for the degree at a school of the first class.

**EGYPT.**—One medical school at Cairo; six years' course. Passing the final examination entitles to a diploma and the right to practice.

**AUSTRALASIA.**—Four medical schools, at Dunedin, New Zealand (Medical Department of University of Otago), Sydney, New South Wales, Adelaide, South Australia, and Melbourne, Victoria. Regulations practically the same as in Great Britain.

## INDEX.

	PAGE.
Act to Regulate the Practice of Medicine in the State of Illinois .....	32
Act to Regulate the Practice of Medicine and Surgery in Montana .....	91
Act to Regulate the Practice of Medicine and Surgery, etc., New Jersey .....	95
Act to Regulate the Licensing and Registration of Physicians and Surgeons, etc., New York .....	98
Act to Regulate the Practice of Medicine in the State of North Dakota .....	119
Act to Regulate the Practice of Medicine and Surgery in the State of Washington .....	159
Acts, medical practice, resume of .....	XX
Age at graduation, table of .....	XVII
Alabama .....	1
— synopsis of practice act .....	XX
Albany Medical College .....	107
American Anthropological University of St. Louis .....	88
American College of Arts and Sciences of the State of New York .....	117
American College of Medicine in Pennsylvania, and the Eclectic Medical College of Philadelphia .....	141
American Eclectic Medical College .....	130
American Health College .....	129
American Institute of Homeopathy .....	XIII
American Medical College Association .....	XIII
American Medical College, Cincinnati .....	122
American Medical College (St. Louis) .....	85
American University of Boston, Medical Department of the .....	71
American University of Pennsylvania .....	141
Apothecaries' Society of London, England .....	177
Argentine Republic, education and practice in .....	211
Arizona, synopsis of practice act .....	XX
Arkansas .....	3
— synopsis of practice act .....	XX
Arkansas Industrial University, Medical Department of .....	3
Army, Navy and Indian Medical Services, Great Britain .....	197
Atlanta Medical College .....	29
Auburn Medical School .....	107
Australasia, medical education in .....	212
Austria, medical education and practice .....	209
Auxiliary Department of Medicine, University of Pennsylvania .....	165
Auxiliary, Polyclinic and Post-Graduate Institutions and Courses .....	165
Baltimore Medical College .....	65
Baltimore Polyclinic and Post-Graduate Medical School .....	167
Baltimore University School of Medicine .....	66
Beach Medical College .....	49
Beach Medical Institute .....	49
Beaumont Hospital Medical College .....	89
Belgium, schools and regulations in .....	209
Bellevue Hospital Medical College .....	112, 169
Bellevue Medical College of Massachusetts .....	71
Bennett College of Eclectic Medicine and Surgery .....	40
Berkshire Medical College .....	69
Board of Examiners of the California State Homeopathic Medical Society .....	4
Board of Examiners of the Eclectic Medical Society of the State of California .....	5
Board of Examiners of the Medical Society of the State of California .....	4
Board of Homeopathic Medical Examiners of Florida .....	27
Board of Medical Examiners of Montana .....	92
Board of Medical Examiners of North Carolina .....	117
Board of Medical Examiners of the State of New York .....	100
Board of Medical Examiners of the State of South Carolina .....	143
Board of Medical Examiners of the State of Tennessee .....	144
Board of Regents of the University of the State of New York .....	103
Bolivia, medical school in .....	211
Boston University School of Medicine .....	69
Botanic Medical College, Memphis .....	117

	PAGE.
Botanico-Medical College of Ohio .....	122
Brazil, medical education and practice in .....	211
Brooklyn Academy of Medicine .....	114
Brown University, Medical Department of .....	143
California .....	4
— synopsis of practice act .....	XX
California Medical College (Eclectic) .....	6
California Medical Society and College of Physicians .....	6
Canada .....	8
Central College of Physicians and Surgeons, Indianapolis .....	47
Central Medical College of New York .....	109
Chaddock School of Medicine .....	43
Charity Hospital Medical College, Cleveland (See Medical Department of the University of Wooster) .....	127
Charity Hospital Medical College, New Orleans .....	61
Chattanooga Medical College .....	150
Chicago College of Science .....	44
Chicago Correspondence University .....	44
Chicago Homeopathic Medical College .....	41
Chicago Medical College (Medical Department of the Northwestern University) .....	38
Chicago Northwestern College .....	40
Chicago Ophthalmic College .....	168
Chicago Polyclinic .....	168
Chili, medical education and practice in .....	211
Cincinnati College of Medicine and Surgery .....	126
Cincinnati Literary and Scientific Institute (See Physio-Medical College) .....	122
Cincinnati Medical College .....	122
Cincinnati Polyclinic .....	167
Clark University, Medical Department, Georgia .....	51
Clark University, Medical Department, Massachusetts .....	71
Cleveland Medical College (Homeopathic) .....	154
Cleveland Medical College (See Western Reserve University, Medical Department) .....	123
Cleveland Polyclinic and Post-Graduate Medical School .....	167
College for Medical Practitioners, St. Louis .....	167
College of American Medicine and Surgery .....	30
College of Medicine and Surgery (Minneapolis) .....	79
College of Medicine in Philadelphia (See Univ. of Penna., Dept. of Medicine) .....	137
College of Homeopathic Medicine and Surgery, Minnesota .....	80
College of Medicine of Syracuse University .....	115
College of Medicine and Surgery, Minnesota .....	79
College of Medicine of the University of Southern California .....	8
College of Physicians and Surgeons, Baltimore .....	64
College of Physicians and Surgeons, Boston .....	70
College of Physicians and Surgeons, Buffalo .....	116
College of Physicians and Surgeons, Chicago .....	42
College of Physicians and Surgeons of Indiana (See Medical College of Indiana) .....	46
College of Physicians and Surgeons (Keokuk) .....	51
College of Physicians and Surgeons of Kansas City (See Kansas City Medical College) .....	84
College of Physicians and Surgeons of Ontario .....	9
College of Physicians and Surgeons of St. Joseph (See Ensworth Medical College, 88) .....	86
College of Physicians and Surgeons of Syracuse University (See College of Medicine of Syracuse University) .....	115
College of Physicians and Surgeons in the City of New York .....	105
College of Physicians and Surgeons of the Upper Mississippi .....	38
College of Physicians and Surgeons of the Western District of New York .....	106
College of Preceptors (Great Britain) .....	177
Colleges in United States and Canada, list of .....	170
Colleges requiring longer study .....	XIV
Colorado .....	21
— synopsis of practice act .....	XX
Colorado State Board of Medical Examiners .....	21
Columbus Medical College .....	129
"Coney Medical Institute," (See Milwaukee College of Physicians and Surgeons) .....	163
Connecticut .....	23
— synopsis of practice act .....	XX
Cooper Medical College .....	5
Cotner University, Medical Department .....	93
Cuba, medical education and practice in .....	211
Curtis Physio-Medical Institute .....	49
Dalhousie University, Faculty of Medicine, (See Halifax Medical College, 18) .....	19
Dartmouth Medical College .....	94
Delaware, synopsis of practice act .....	XX
Denmark, schools and regulations in .....	209
Department of Medicine and Surgery of the University of Michigan .....	72
Department of Medicine of the College of Philadelphia, (See University of Pennsylvania, Department of Medicine) .....	137
Degree, M. D., in United States .....	XXII
Degrees, Institutions that do not grant, (Great Britain and Ireland) .....	109
Detroit College of Medicine .....	74
Detroit Homeopathic Medical College .....	73
Detroit Medical College .....	73

	PAGE.
District of Columbia .....	24
— synopsis of practice act.....	XX
Druidic Banchoreion, New York.....	117
Druidic University of Maine.....	63
East Tennessee Wesleyan University, (See Chattanooga Medical College).....	150
Eclectic College of Medicine and Surgery, (Cincinnati).....	127
Eclectic College of Physicians and Surgeons, (Indianapolis).....	49
Eclectic Medical College, (Kentucky).....	58
Eclectic Medical College of Maine.....	63
Eclectic Medical College of the City of New York.....	113
Eclectic Medical College of Pennsylvania.....	141
Eclectic Medical College of Philadelphia.....	141
Eclectic Medical Institute, (Cincinnati).....	124
Ecole de Medecine et de Chirurgie.....	16
Edinburgh Medical College.....	119
Edinburg University of Chicago and St. Louis.....	40
Education and registration in Great Britain.....	174
Education, medical, and Registration, General Council of.....	174
— (preliminary).....	XI
— in Foreign Countries.....	204
— Austria.....	206
— Belgium.....	206
— Brazil.....	206
— Chili.....	206
— Cuba.....	206
— Denmark.....	206
— France.....	205
— Germany.....	205
— Holland.....	206
— Italy.....	206
— Portugal.....	206
— Spain.....	206
— Sweden, Norway and Finland.....	206
— Switzerland.....	206
— Uruguay.....	207
Educational Institute of Scotland.....	177
Egypt, medical education in.....	212
Ensoworth Medical College.....	8
Examinations, results of, before Boards of Examiners.....	V
Examining Board in England by the Royal College of Physicians of London and the Royal College of Surgeons of England.....	190
Examining Bodies in the United Kingdom.....	173, 177
Excelsior Medical College, Massachusetts.....	71
Excelsior Medical College, New York City.....	110
First Medical College of the American Health Society.....	71
Florida.....	27
— synopsis of practice act.....	XX
Fort Wayne College of Medicine.....	47
France, schools and regulations in.....	209
Franklin Medical College.....	39
Galveston Medical College, (See Texas Medical College and Hospital).....	151
Gautemala, medical school in.....	210
General Council of Medical Education and Registration of the United Kingdom.....	174
Georgia.....	28
— synopsis of practice act.....	XX
Geneva Medical College, (See College of Medicine of Syracuse University, 115).....	107
Georgia College of Eclectic Medicine and Surgery.....	30
Georgia Eclectic Medical College, (See Georgia College of Eclectic Medicine and Sur- gery).....	30
Germany, course of study in.....	207
— examinations in.....	208
— schools and requirements.....	207
Graduates, summary for ten years.....	XXV
Graduation, age of, table.....	XVII
Graduation Requirements, Foreign (exclusive of Great Britain and Ireland).....	207
Greece, schools and regulations in.....	210
Graffenberg Institute.....	3
Great Britain and Ireland.....	174
Gross Medical College.....	23
Hahneman Medical College and Hospital, Chicago.....	39
Hahneman Medical College and Hospital, Philadelphia.....	139
Hahnemann Hospital College of San Francisco.....	7
Halifax Medical College.....	18
Halifax School of Medicine, (See Halifax Medical College).....	18
Hannibal Medical College of Memphis, Tennessee.....	150
Harvard University, Medical School.....	67-169
Hering Medical College, (See Homeopathic Medical College of Missouri, 83).....	87
Holland, schools and regulations in.....	210
Homeopathic College for Women, Cleveland, (See Homeopathic Hospital College).....	125

	PAGE.
Homeopathic Hospital College, Cleveland.....	125
Homeopathic Medical College of Missouri.....	83
Homeopathic Medical College of Philadelphia.....	139
Homeopathic Medical College of St. Louis, (See Homeopathic Medical College of Missouri, 83).....	85
Homeopathic Medical College of the University of Michigan.....	73
Homeopathic Medical Department, State University of Iowa.....	52
Homeopathic Medical Department of the University of Minnesota, (See College of Homeopathic Medicine and Surgery).....	80
Hospital College of Medicine, Louisville.....	59
Hospital Medical College of Evansville.....	49
Howard University, Medical Department.....	26
Humboldt Institute, (See Humboldt Medical College).....	83
Humboldt Medical College.....	83
Hygeo-Therapeutic College, New Jersey.....	97
Hygeo-Therapeutic College of New York.....	110
Hygiene, colleges that do not teach.....	XXII
Idaho, synopsis of practice act.....	XX
Illinois.....	32
Illinois College, Medical Department of.....	38
Illinois Medical-Practice Act.....	32
— synopsis of.....	XX
Illinois State Board of Health.....	31-36
India, medical education in.....	211
Indiana.....	44
— synopsis of practice act.....	XX
Indiana Central Medical College.....	45
Indiana Eclectic Medical College.....	48
Indiana Medical College (See La Porte University, Medical Department).....	44
Indian Territory, synopsis of practice acts.....	XX
Institutions and students, summary of.....	XXIV
Institutions that do not grant degrees (Great Britain and Ireland).....	199
Institutions having an incomplete curriculum (Great Britain and Ireland).....	200
Intermediate Education Board of Ireland.....	177
International Electropathic Institution.....	134
Iowa.....	50
— synopsis of practice act.....	XX
Iowa College of Physicians and Surgeons, Des Moines.....	53
Iowa Eclectic Medical College.....	54
Iowa Medical College, Des Moines (Eclectic).....	55
Iowa Medical College, Keokuk.....	51
Italy, schools and regulations in.....	210
Japan, medical education in.....	212
Jefferson Medical Association.....	147
Jefferson Medical College.....	138
Jefferson School of Medicine.....	60
Jehns Hopkins University, Medical Department.....	67
Joplin College of Physicians and Surgeons.....	87
Joplin Medical College.....	87
Kansas.....	55
— synopsis of practice act.....	XX
Kansas City Homeopathic Medical College.....	90
Kansas City Hospital College of Medicine.....	89
Kansas City Medical College.....	84
Kansas Medical College, Independence.....	55
Kansas Medical College, Topeka.....	55
Kentucky.....	56
— synopsis of practice act.....	XX
Kentucky School of Medicine.....	58
Keokuk Medical College.....	54
King Eclectic Medical College, (Iowa).....	54
La Porte University, Medical Department.....	44
Laval University, Medical Departments.....	16
Lecture terms, duration of.....	XXV
Leonard Medical School.....	119
License to Practice Medicine in Foreign Countries, requirements for.....	207
License to Practice Medicine (New York).....	98
Licensing Bodies, examining and, in Great Britain.....	173
Lincoln University, Medical Department.....	141
Livingston University.....	97
Long Island College Hospital.....	110
Louisiana.....	61
— synopsis of practice act.....	XX
Louisville Medical College.....	58
Louisville National Medical College.....	60



	PAGE.
M. D. Degree in United States.....	XXII
Maine.....	62
— synopsis of practice act.....	XX
Manitoba.....	20
Manitoba Medical College.....	20
Marion-Sims College of Medicine.....	91
Maryland.....	63
— synopsis of practice act.....	XX
Massachusetts.....	67
— synopsis of practice act.....	XX
Matriculates and Graduates, each State, 1879-80 to 1888-89, inclusive.....	XXVIII
Matriculates and Graduates—Table of totals and percentages.....	XXV
McGill University, Faculty of Medicine.....	15
Medical and Surgical College of the State of New Jersey.....	97
Medical Association of the State of Alabama.....	1
Medical College in the City of Baltimore. (See Univ. of Maryland, School of Med.).....	63
Medical College of Alabama.....	3
Medical College of Evansville.....	44
Medical College of Ft. Wayne.....	45
Medical College of Georgia.....	28
Medical College of Indiana.....	46
Medical College of Kansas City.....	85
Medical College of Louisiana. (See Medical Department Tulane University).....	61
Medical College of New York City.....	110
Medical College of Ohio.....	121
Medical College of South Carolina.....	144
Medical College of the Pacific. (See Cooper Medical College).....	5
Medical College of the State of South Carolina.....	144
Medical Colleges of the United States and Canada.....	170
Medical College of Virginia.....	158
Medical Department, Arkansas Industrial University.....	3
Medical Department, Asbury University. (See Indiana Central Medical College).....	45
Medical Department, Butler University. (See Medical College of Indiana).....	46
Medical Department, Central University. (See Hospital College of Medicine).....	59
Medical Department, Coker University.....	93
Medical Department, Cumberland University. (See Memphis Medical College).....	147
Medical Department, National University.....	26
Medical Department of Adelbert College of the Western Reserve University. (See Western Reserve University, Medical Department).....	123
Medical Department of Brown University.....	143
Medical Department of Columbia College. (See College of Physicians and Surgeons in the City of New York).....	105
Medical Department of Columbia College. (See National Medical College).....	24
Medical Department of Drake University. (See Iowa Medical College)—(Iowa College of Physicians and Surgeons).....	53
Medical Department of Hampden Sidney College. (See Medical College of Virginia).....	158
Medical Department of Illinois College.....	38
Medical Department of Jefferson College at Cannonsburg, Pa. (See Jefferson Medical College).....	138
Medical Department of Kemper College (See Missouri Medical College).....	81
Medical Department of Lind University (See Chicago Medical College).....	38
Medical Department of McGill University, Faculty of Medicine.....	15
Medical Department of Niagara University.....	116
Medical Department of Ohio University (See Worthington Medical College).....	122
Medical Department of Queen's College, New Jersey (See New Medical Institution).....	106
Medical Department of Randolph Macon College, Va.....	158
Medical Department of the Lake Forest University. (See Rush Medical College).....	36
Medical Department of Straight University.....	61
Medical Department of the American University of Boston.....	71
Medical Department of the Columbian University (See National Medical College).....	24
Medical Department of Shaw University (See Leonard Medical School).....	119
Medical Department of the Nebraska Christian University (See Medical Department Coker University).....	93
Medical Department of the Northwestern University (See Chicago Medical College).....	38
Medical Department of the Pennsylvania College at Gettysburg (See Pennsylvania Medical College).....	138
Medical Department of the Rocky Mountain University (See Gross Medical College).....	23
Medical Department of the St. Louis University (See St. Louis Medical College).....	82
Medical Department of the Taylor University (See Fort Wayne College of Medicine).....	47
Medical Department of the University of Buffalo.....	108
Medical Department of the University of Cincinnati (See Medical College of Ohio, 121) (See Miami Medical College).....	126
Medical Department of the University College of San Francisco (See Cooper Medical College).....	5
Medical Department of the University of Minnesota (See College of Medicine and Surgery).....	79
Medical Departments of the University of Nashville and Vanderbilt University.....	146
Medical Department of the University of North Carolina.....	119
Medical Department of the University of San Antonio.....	151
Medical Department of the University of the Pacific (See Cooper Medical College).....	5
Medical Department of the University of Vermont.....	152
Medical Department of the Western University.....	13
Medical Department of Transylvania University.....	57
Medical Department of Union University (See Albany Medical College).....	107

	PAGE.
Medical Department of U. S. Grant University (See Chattanooga Medical College).....	150
Medical Department of Victoria College.....	12
Medical Department of Washington College, Pa. (See Washington University, School of Medicine).....	64
Medical Department of Williams College (See Berkshire Medical College).....	69
Medical Department of Yale College (See Yale University Department of Medicine).....	23
Medical Department, San Antonio University.....	151
Medical Department Southwestern Baptist University (See Memphis Hospital Medical College).....	149
Medical Department State University of Iowa.....	51
Medical Department, Tulane University of Louisiana.....	61
Medical Department, University of California.....	6
Medical Department, University of Colorado.....	22
Medical Department, University of Georgia (See Medical College of Georgia).....	28
Medical Department, University of Iowa, (See College of Physicians and Surgeons).....	51
Medical Department, University of Missouri.....	83
Medical Department, University of St. Charles.....	38
Medical Department, University of Tennessee.....	148
Medical Department, University of the State of Missouri, Section No. 1. (See Medical Department, University of Missouri).....	83
Medical Department, University of the State of Oregon.....	136
Medical Department of the University of Wooster.....	127
Medical Department, Willamette University.....	195
Medical Education in the United States and Canada.....	III
Medical Education in Foreign Countries.....	174
Medical Examining Board of Virginia.....	155-157
Medical Examining Board of New York.....	100
Medical Faculty of King's College. (See Toronto University Medical Faculty).....	10
Medical Faculty of Queen's University. (See Royal College of Physicians and Surgeons).....	12
Medical Faculty of the University of Toronto.....	10
Medical Faculty of Trinity College. (See Trinity Medical College).....	11
Medical Institution of Morgan City, Utah.....	152
Medical Institution of Yale College. (See Yale University, Department of Medicine).....	23
Medical Practice Act, Illinois.....	32
Medical Practice Act, Montana.....	91
Medical Practice Act, New Jersey.....	95
Medical Practice Act, New York.....	98
Medical Practice Act, North Dakota.....	119
Medical Practice Act, Washington.....	159
Medical School of Maine, at Bowdoin College.....	62
Medical University of Ohio.....	134
Medico-Chirurgical College of Philadelphia.....	141
Meharry Medical Department of Central Tennessee College.....	148
Memphis Hospital Medical College.....	149
Memphis Medical College.....	147
Metropolitan Medical College.....	110
Mexico, Medical Education in.....	211
Miami Medical College.....	126
Michigan.....	72
— synopsis of practice act.....	XX
Michigan College of Medicine.....	74
Michigan College of Medicine and Surgery.....	75
Michigan Homeopathic Medical College.....	75
Midwives, Illinois requirements.....	XXXIV
Milwaukee College of Physicians and Surgeons.....	163
Minneapolis College of Physicians and Surgeons.....	76
Minnesota.....	76
— synopsis of practice act.....	XX
Minnesota Homeopathic Medical College.....	79
Minnesota State Board of Medical Examiners.....	76
Minnesota Hospital College.....	78
Mississippi, synopsis of practice act.....	XX
Missouri.....	80
— synopsis of practice act.....	XX
Missouri Medical College.....	81
Montana.....	91
— synopsis of practice act.....	XX
Montreal Medical Institution. (See McGill University Faculty of Medicine).....	15
Nashville Medical College. (See Medical Department, University of Tennessee).....	148
National Medical College.....	24
National Normal University, College of Medicine.....	133
National University, Medical Department.....	26
National University of Chicago.....	44
Nebraska.....	92
— synopsis of practice act.....	XX
Nebraska School of Medicine. (See Omaha Medical College).....	92
Nevada, synopsis of practice act.....	XX
New England Botanic-Medical College.....	69
New England Female Medical College.....	69
New England University of Arts and Sciences, Boston.....	71
New England University of the Arts and Sciences, Manchester.....	94
New Hampshire.....	94
— synopsis of practice act.....	XXI

	PAGE.
New Hampshire Medical Institute. (See Dartmouth Medical College).....	94
New Jersey.....	95
— synopsis of practice act.....	XXI
New Medical Institution.....	106
New Orleans Polyclinic.....	168
New Orleans School of Medicine.....	61
New Orleans University, Medical Department.....	62
New York.....	98
— synopsis of practice act.....	XXI
New York Free Medical College for Women.....	115
New York Homeopathic Medical College.....	111
New York Medical College.....	110
New York Medical College and Hospital for Women.....	112
New York Polyclinic.....	165
New York Post-Graduate Medical School and Hospital.....	166
New York Reformed Medical College.....	106
New York School of Medicine.....	106
Niagara University, Medical Department of.....	116
North Carolina.....	117
— synopsis of practice act.....	XXI
North Dakota.....	119
— synopsis of practice act.....	XXI
Northwestern Medical College, St. Joseph, Mo.....	87
Northwestern Ohio Medical College.....	132
Norway, schools and regulations in.....	210
Nova Scotia.....	18
Occidental College of Physicians and Surgeons.....	89
Oglethorpe Medical College.....	29
Ohio.....	121
— synopsis of practice act.....	XXI
Ohio College of Obstetrics, Medicine and Midwifery.....	134
Omaha Medical College.....	92
Ontario.....	9
Ontario Medical Act.....	9
Oregon.....	135
— Synopsis of Practice Act.....	XXI
Oregon State Board of Medical Examiners.....	185
Oxford and Cambridge Schools Examination Board.....	177
Pennsylvania.....	137
— Synopsis of Practice Act.....	XXI
Pennsylvania Medical College.....	138
Penn Medical University.....	141
Peru, Medical Education and Practice.....	211
Pharmaceutical Society of Great Britain.....	177
Pharmaceutical Society of Ireland.....	177
Philadelphia College of Medicine and Surgery.....	139
Philadelphia Polyclinic and College for Graduates in Medicine.....	166
Philadelphia University of Medicine and Surgery.....	141
Physio-Eclectic Medical College.....	130
Physio-Medical College, (Cincinnati).....	122
Physio-Medical Institute, Chicago.....	43
Physio-Medical Institute, Cincinnati.....	127
Physio-Medical College of Indiana.....	45
Portland School for Medical Instruction.....	63
Post-Graduate Medical School and Hospital of Chicago.....	168
Post-Graduate Polyclinic of Eclectic Medicine and Surgery.....	169
Pulte Medical College.....	128
Quebec.....	15
Quebec School of Medicine (See Laval University, Medical Departments).....	16
Queen's College, Belfast.....	177
Queen's College, Cork.....	177
Queen's College, Galway.....	177
Queen's University in Ireland.....	177
Randolph Macon College, Medical Department of.....	158
Reform Medical College, Georgia.....	29
Regents of the University of the State of New York.....	103
Regulation of the Practice of Medicine in Foreign Countries.....	174
Regulations for Conducting Examinations, New Jersey.....	96
Regulations of Medical Examining Boards in the United Kingdom.....	178
Registration of Medical Students in Great Britain and Ireland.....	174
Requirements for Graduation in Foreign Countries.....	207
Requirements for License to Practice Medicine in Foreign Countries.....	207
— Minimum, of Illinois Board.....	XXXIII, 36
— New.....	XXXIV, 36
Rhode Island.....	143
— Synopsis of Practice Act.....	XXI
Rochester Eclectic Medical College.....	109
"Rolph's" School (See Medical Department of Victoria College).....	12
Roumania, Schools and Regulations.....	210
Royal College of Physicians and Royal College of Surgeons in Ireland.....	194

	PAGE.
Royal College of Physicians and Surgeons, Kingston.....	12
Royal College of Physicians and Surgeons of Edinburgh, Scotland.....	177
Royal College of Physicians and Surgeons of Edinburgh, and Faculty Physicians and Surgeons of Glasgow.....	192
Royal College of Physicians and Surgeons in London.....	190
Royal College of Surgeons in Ireland.....	177
Royal College of Surgeons in Ireland and the Apothecaries Hall of Ireland.....	197
Royal College of Surgeons of England.....	190
Royal University of Ireland.....	177, 189
Rush Medical College.....	96
Russia, Schools and Regulations.....	210
San Antonio University, Medical Department.....	151
Savannah Medical College.....	29
Schedule of Minimum Requirements, Illinois State Board of Health.....	XXXIII, 36
Schedule of Minimum Requirements—for schools of Midwifery.....	36
School of Biology of the University of Pennsylvania.....	167
Schools in Great Britain and Ireland having an Incomplete Curriculum.....	200
Schools in Great Britain and Ireland that do not grant Degrees.....	199
Schools of Midwifery—regulations for.....	96
Scotch Education Department.....	177
Shelby Medical College.....	147
Society of Apothecaries, London.....	196
South Carolina.....	143
— Synopsis of Practice Act.....	XXI
South Dakota, Synopsis of Practice Act.....	XXI
Southern Botanic-Medical College (See Reform Medical College).....	28
Southern Medical College.....	30
Southern University Medical Department.....	3
Spain, Schools and Regulations.....	210
Starling Medical College.....	124
State Board of Health of Missouri.....	80
State Board of Health, West Virginia.....	162
State Board of Homeopathic Medical Examiners of Florida.....	27
State Board of Medical Examiners of Colorado.....	21
State Board of Medical Examiners of Iowa.....	50
State Board of Medical Examiners of Montana.....	92
State Board of Medical Examiners of New Jersey.....	96
State Board of Medical Examiners of North Dakota.....	121
State Boards of Medical Examiners of Florida.....	27
State Medical Examining Board of Minnesota.....	76
State Medical Examining Board of Washington.....	161
State Medicine, Instruction in.....	XXI
State University of Iowa, Medical Department.....	51
St. Joseph Hospital Medical College. (See Ensworth Medical College, 88).....	86
St. Joseph Medical College. (See Ensworth Medical College).....	88
St. Lawrence School of Medicine.....	16
St. Louis College of Homeopathic Physicians and Surgeons.....	85
St. Louis College of Medicine and Natural Sciences. (See Humboldt Medical College).....	83
St. Louis College of Physicians and Surgeons.....	85
St. Louis Eclectic Medical College.....	86
St. Louis Hahnemann Medical College.....	85
St. Louis Hygienic College of Physicians and Surgeons.....	90
St. Louis Medical College.....	82
St. Louis Post-Graduate School of Medicine.....	167
St. Paul Medical College.....	79
Straight University, Medical Department of.....	61
Students, in United State- and Canada, Summary of.....	XXIV
— Table of Increase of, in ten years.....	XXII
Sweden, Schools and Regulations.....	210
Switzerland, Schools and Regulations.....	209
Syracuse Medical College.....	109
Syria, Medical Education in.....	211
Tennessee.....	144
— Synopsis of Practice Act.....	XXI
Tennessee Medical College.....	149
Texas.....	151
— Synopsis of Practice Act.....	XXI
Texas Medical College and Hospital.....	151
Thompsonian College.....	28
Toland Medical College. (See Medical Department, University of California).....	6
Toledo Medical College.....	131
Toledo School of Medicine.....	130
Toronto School of Medicine.....	10
Transylvania University, Medical Department of.....	57
Trinity University, College of Medicine and Surgery of the State of Vermont.....	153
Trinity Medical College.....	11
Turkey, Schools and Regulations.....	210
Union Medical Institute, Newbury, Vermont.....	154
United States Medical College.....	116
— — M. D. Degree in.....	XXII
— — of Colombia, Medical School in.....	211

	PAGE.
Universities in the United Kingdom.....	176
University Medical College of Kansas City.....	88
University Medical College. (See University of the City of New York, Medical Department).....	108
University of Aberdeen.....	176, 186
University of Buffalo, Medical Department of the.....	108
University of Bishops College, Faculty of Medicine.....	17
University of California, Medical Department.....	6
University of Cambridge, England.....	176, 178
University of Colorado, Medical Department.....	22
University of Denver, Medical Department.....	21
University of Dublin.....	177, 178
University of Durham.....	176, 181
University of Edinburgh.....	176, 184
University of Florida, Medical Department.....	28
University of Georgetown, Medical Department.....	25
University of Glasgow.....	176, 185
University of Halifax. (See Halifax Medical College).....	18
University of Indiana.....	44
University of Kansas City, Medical Department.....	88
University of Kansas, Preparatory Medical Course.....	55
University of London.....	176, 179
University of Louisiana. (See Medical Department, Tulane University of Louisiana).....	61
University of Louisville, Medical Department.....	57
University of Manitoba. (See Trinity Medical School) and (Manitoba Medical College).....	20
University of Maryland School of Medicine.....	63
University of Minnesota Homeopathic Medical Department. (See College of Homeopathic Medicine and Surgery).....	80
University of Minnesota, Medical Department. (See College of Medicine and Surgery).....	79
University of Missouri, Medical Department.....	83
University of Nashville and Vanderbilt University, Medical Departments.....	146
University of Nebraska, College of Medicine.....	93
University of Nebraska, College of Medicine, Eclectic Department.....	93
University of Nebraska, College of Medicine, Homeopathic Department.....	93
University of New Hampshire, Department of Medicine.....	94
University of North Carolina, Medical Department of.....	119
University of Oxford, England.....	176, 178
University of Pennsylvania, Department of Medicine.....	137
— Auxiliary Department.....	165
University of San Antonio, Medical Department of the.....	151
University of South Carolina, Medical Department.....	144
University of Spokane Falls, College of Medicine.....	162
University of St. Andrews.....	177, 187
University of St. Charles, Medical Department.....	38
University of Tennessee, Medical Department.....	148
University of the City of New York, Medical Department.....	108
University of the State of Oregon, Medical Department.....	136
University of Toronto, Medical Faculty. (See Trinity Medical College).....	10
University of Trinity College. (See Trinity Medical College) and (Women's Medical College, Toronto).....	11
University of Victoria College. (See Toronto Medical College).....	10
University of Victoria. (See Ecole de Medecine et de Chirurgie).....	16
University of Virginia, Medical Department.....	158
University of Wisconsin.....	163
University of Wooster, Medical Department of the.....	127
Upper Canada School of Medicine. (See Trinity Medical College).....	11
Uruguay, Medical Education in.....	211
Utah.....	152
— Synopsis of Practice Act.....	XXI
Venezuela, Medical Education in.....	211
Vermont.....	152
— Synopsis of Practice Act.....	XXI
Vermont Academy of Medicine.....	152
Vermont Medical College.....	153
Vermont Medical College, or the Second Medical College of the American Health Society, for Scientific and Benevolent Purposes.....	153
Victoria College, Medical Department of.....	12
Victoria University, England.....	176-182
Victoria University. (See Trinity Medical College).....	11
Virginia.....	155
— Synopsis of Practice Act.....	XXI
Washington.....	159
— Synopsis of Practice Act.....	XXI
Washington Biochemical College.....	161
Washington University School of Medicine.....	64
Western College of Homeopathic Medicine. (See Homeopathic Hospital College, Cleveland).....	125
Western Homeopathic College (Cleveland). (See Homeopathic Hospital College).....	125
Western Pennsylvania Medical College.....	142
Western Reserve University, Medical Department.....	123
Western University, Medical Department of the.....	13
West Virginia.....	162
— Synopsis of Practice Act.....	XXI

	PAGE.
West Virginia University.....	163
Wichita Medical College.....	55
Willamette University, Medical Department of the.....	135
Willoughby University, Medical Department.....	122
Winchester Medical College.....	158
Winona Medical School.....	78
Wisconsin.....	163
— Synopsis of Practice Act.....	XXI
Woman's Medical College of Baltimore.....	66
Woman's Medical College of Chicago.....	41
Woman's Medical College of Georgia and Training School for Nurses.....	31
Woman's Medical College of Pennsylvania.....	140
Woman's Medical College of St. Louis.....	89
Woman's Medical College of the New York Infirmary.....	114
Woman's Medical College (Toronto).....	14
Women's Medical College, Cincinnati.....	132
Women's Medical College, Kingston.....	14
Worcester Medical College (Eclectic).....	69
Worthington Medical College.....	122
Wyoming, Synopsis of Practice Act..	XXI
Yale Medical School (Yale University, Department of Medicine).....	23
Yale University, Department of Medicine.....	23
Zanesville Academy of Medicine.....	130







PRELIMINARY REPORT TO THE  
ILLINOIS STATE BOARD OF HEALTH.

---

**WATER SUPPLIES OF ILLINOIS**

AND THE  
**POLLUTION OF ITS STREAMS.**

---

BY JOHN H. RAUCH, M. D., *Secretary.*

---

WITH TWO APPENDICES:

*I.—Chemical Investigations of the Water Supplies of Illinois.  
By Prof. J. H. Long.*

*II.—The Illinois River Basin in Its Relations to Sanitary  
Engineering. By L. E. Cooley, C. E.*

---

SPRINGFIELD, ILL.:  
H. W. ROKKER, PRINTER AND BINDER.  
1889.



PRELIMINARY REPORT TO THE  
ILLINOIS STATE BOARD OF HEALTH.

---

WATER SUPPLIES OF ILLINOIS  
AND THE  
POLLUTION OF ITS STREAMS.

---

BY JOHN H. RAUCH, M. D., *Secretary.*

---

WITH TWO APPENDICES:

- I.—Chemical Investigations of the Water Supplies of Illinois.  
By Prof. J. H. Long.*
- II.—The Illinois River Basin in Its Relations to Sanitary  
Engineering. By L. E. Cooley, C. E.*
- 

SPRINGFIELD, ILL.  
1889.



## NOTE.—Explanatory and Supplemental.

---

In order to meet the inquiries of members of the present General Assembly for information concerning certain subjects of pending legislation, the State Board of Health has authorized the preparation of the following preliminary report on the Water Supplies of Illinois and the Pollution of its Streams— The matter has been necessarily prepared hastily—*only ten days having elapsed since the results of the last chemical investigations were received in the Secretary's office.* This hurried preparation will also account for the incomplete appearance of the document. It is believed, however, that enough is furnished to give a good general idea of the character and scope of the work, to foreshadow the results of the completed report, and to determine with substantial accuracy some of the most important questions involved in the bill for an act to create sanitary districts in Illinois.

It will be seen from the following pages that the opinions of the Secretary, formulated more than ten years ago, concerning the essential sanitary interests of the communities in the Desplaines and Illinois valleys, have undergone no material modification, but are substantially corroborated by these subsequent investigations and study. For the remedy of the nuisance created by the drainage of Chicago into the Illinois and Michigan Canal and the Illinois river, it is demonstrated that the minimum quantity of water pumped at Bridgeport heretofore recommended is absolutely necessary. That quantity was fixed by the Secretary in 1879 at 60,000 cubic feet per minute when the population draining into the river was less than 400,000.

Subsequently it has taken the form of a general statement—frequently repeated in reports to the Board—that the sanitary interests of the communities in the Desplaines and Illinois valleys demand that the sewage of Chicago pumped into the canal shall be diluted on the scale of 14,000 cubic feet per minute for every 100,000 inhabitants as a minimum. In winter, when oxidation is retarded by ice formation shutting out light and air, by low temperature and by impeded motion, a greater rather than a lesser quantity should be pumped. The recent analyses fully sustain this dictum.

As a matter of fact the average quantity pumped during the period covered by these investigations did not exceed 45,000 cubic feet during the summer of 1888, and not more than 38,000 cubic feet during the last winter. This quantity is less than one-half the minimum dilution necessary to prevent nuisance at Joliet.

The city of Chicago should be required to increase the capacity of the pumping plant at Bridgeport to 100,000 cubic feet at once. With a comparatively small outlay—say \$10,000—the canal can be made to carry this quantity readily although it is probable that one or two bridges would require to be raised somewhat.

For further relief pumps should be erected at some suitable point of discharge into the Desplaines river, and these should be of the capacity recommended in 1879, to-wit: 150,000 cubic feet per minute. If such discharge into the Desplaines be secured promptly then a lesser quantity may be pumped into the canal and the necessity of raising the bridges would be obviated. But with the sewage of over 800,000 inhabitants already tributary to the canal the minimum dilution above specified requires at the present time that at least 112,000 cubic feet per minute be pumped into these channels. This quantity may readily be drawn through the south branch without creating too great a current; but it may be necessary to provide some other source of supply from Lake

Michigan for the maximum quantity of 250,000 cubic feet which will be required for the population before the close of the century on the most conservative estimate of growth.

Even if the project for a great waterway from Lake Michigan to the Illinois river were under way to-day, such additional pumping will be needed before the work could be completed and made available for this relief of the communities in the lower valleys—a relief which is now imperatively demanded as a sanitary necessity.

While these sheets are in the printer's hands, a report on the sewage of the Mystic and Charles river valleys is received. This was prepared in accordance with instructions from the General Court by the State Board of Health of Massachusetts and, with its appended documents and maps, forms a volume of 138 octavo pages. Plans and estimates were made for each of the three principal methods of sewage disposal, to-wit: (1) Discharge of the crude sewage into the outgoing tidal currents; (2) partial purification by intermittent filtration; (3) chemical precipitation and discharge of effluent into the tide during first ebb. The plans and estimates for each method were prepared by engineers specially qualified in the respective methods. Upon review of the plans by the chief engineer of the Board and an associate consulting engineer, the first method—that of discharge of the crude sewage upon the first of the ebb tide, a method essentially the same as that of discharge into a non-tidal river of sufficient volume—was selected and approved.

This result is in substantial accord with the considerations set forth in the following pages as to the relative practicability of the three methods. The territory covered by the report includes an area of 130 square miles surrounding Boston on the north, south and west, and having a population of less than 150,000. The cost of the investigations and report was \$25,000. The Preliminary Report of the Drainage and Water Supply Commission of the City of Chicago, published in January, 1887, also covered three methods, to-wit: (1) Discharge of the crude sewage into Lake Michigan; (2) disposal on land by intermittent filtration; (3) discharge into the Desplaines river. Plans and estimates for the first two methods were prepared in sufficient detail to demonstrate their impracticability.

The discharge into Lake Michigan would involve an expenditure of at least \$37,000,000 and an annual expense of over \$2,400,000 for interest and maintenance. Aside from the cost the Commission rejected this method because, while it might be practicable for some years to allow the sewage in its crude form to enter the lake under the conditions prescribed, the necessity would sooner or later arise for clarifying it previous to its discharge. The experience of London and other large cities does not warrant the adoption of a plan involving such a contingency.

As to the second method—that of disposal by land—it is apparent from the tenor of the report that the Commission was strongly predisposed in its favor, and only abandoned it when it became obvious that suitable land in sufficient quantity was not available within the borders of the State at any practicable distance. Given a suitable body of land the plans of the Commission for the disposal of the metropolitan sewage alone, by intermittent filtration and sewage farming, would require an investment of about \$58,000,000, with an annual expense of over \$3,000,000 for interest, pumping and maintenance after deducting the profit from sale of crops. The disposal of the sewage of the Calumet region would add about \$4,000,000 to the cost of this plan, or a total of \$62,000,000.

Compelled to the rejection of both these plans the Commission next took up the third solution of the drainage problem on the lines recognized by that distinguished engineer, Mr. E. S. Chesbrough, as early as 1856, and fully outlined in the extracts—reprinted in the following pages—from a report to the Illinois State Board of Health on the "Sanitary Problems of Chicago" made by the Secretary in 1879.\* This solution consists, in brief, of such modification of the conditions which have existed since 1871—when the "deep cut" in the Illinois and Michigan Canal was completed—as shall secure

---

\*See page IV et seq., of the Preliminary Report which follows.

a flow of water from Lake Michigan into the Illinois river ample at all times to dilute the sewage beyond the point of offensiveness to the senses or injury to health. As shown on p. 65 of the appendix to this Preliminary Report,<sup>†</sup> there was in 1888 a population of 842,300 inhabitants, the sewage of which, so far as it is disposed of at all, is discharged into the Illinois and Michigan canal by the pumps at Bridgeport. For present practical purposes the aggregate water supply may be assumed as the measure of the sewage product—any material variation, either as to volume or density, being compensated for by the storm-water discharge and its incident pollution, the character of wastes from stock yards, slaughter houses, etc.,—so that it will not be far out of the way to state the daily sewage product now tributary to the canal at 150,000,000 gallons per day. During the summer of 1888, as already stated, the Bridgeport pumps discharged into the canal 45,000 cubic feet per minute, or 485,280,000 gallons per day. Roughly stated, this was composed of one part of sewage and two parts of lake water. During the winter the proportion of sewage was somewhat greater, in the ratio of 45,000 to 38,000—the number of cubic feet pumped in the summer and the winter respectively.

The Commission finally approved of the project for the construction of an artificial waterway capable of carrying 600,000 cubic feet per minute, through the Chicago river and the necessary conduits, from Lake Michigan to Lake Joliet. This quantity of water per minute represents 6,480,000,000 gallons per day. If we admit that the ultimate population in the area to be drained will reach 2,500,000, and that its average sewage product (150 gallons per head) will amount to 375,000,000 gallons per day, this quantity—6,480,000,000 gallons—would give a fraction over 17 dilutions, or more than sixteen parts of lake water to one of sewage, instead of two parts lake water to one of sewage as now. It is to be noted that this would be the minimum dilution, and not likely to be reached until sometime between 1910 and 1915.

From four different sets of observations—made in the summer of 1886, in the winter of 1886-7, in the summer of 1888, and in January, February and March, 1889\*—there is no hesitation in saying that even this minimum dilution, for the maximum population which we are warranted in considering attainable, would suffice to prevent any nuisance from Chicago sewage long before it reached Lockport, and that the sanitary condition of the Desplaines and Illinois rivers would be greatly benefited in every respect. The large amount of dissolved oxygen in the lake water and its freedom from organic impurity would not only hasten the decomposition of the sewage—resolving it into its harmless inorganic elements—but in the volume proposed it would assist in the oxidation of the sewage from the river towns, as well as of the large amount of organic matter of vegetable origin contributed to the Illinois by many of its tributaries. For further details in this connection the reader is referred to the report proper and to the two appendices.

Among other points clearly indicated by the chemical analyses and sanitary investigations is the necessity of continuous observations of the water supplies of cities, towns and villages and of the State institutions throughout a long period. It cannot be too strongly urged that these observations should be of a general sanitary character, embracing the source and history of the water, its observed effects upon health, etc. It will not do to place reliance solely upon the answers to reagents and tests in the chemist's laboratory. These, unless taken in connection with all the surroundings, may be very misleading. Water analysis has undergone a radical change within the past few years. Even so late as 1881, examinations of water by three separate processes, each of which had its pronounced-supporters, gave the most confounding results. Of 19 waters, known by long experience to be productive of no harmful effects and regarded as wholesome, only 5 were pronounced "good" by all the processes; 8 others of this class were pronounced "good" by some, and "fair," "medium," or "allowable" by the others; 3 were accounted "bad" by one process, 1 by two processes, and two by all of the processes. Of twenty waters of more or less doubtful or suspected character, 9 were reported "good" or "allowable" by all the methods, 5 "bad" by one, 3 by two, and 3 others by all.

<sup>†</sup>The Illinois River Basin in its Relations to Sanitary Engineering. By L. E. Cooley, C. E.

\*See pages XXVII-XXX of the following report.

Of 20 waters which were believed on strong grounds to have produced disease among those drinking them, 10 were pronounced "good" or "allowable" by all the processes, 6 "bad" by one process, 1 by two and only 3 by all. As Prof. J. W. Mallett, F. R. S., who conducted this examination for the National Board of Health, says in his report: It is not possible to decide absolutely upon the wholesomeness or unwholesomeness of a drinking-water by the mere use of any of the processes examined for the estimation of organic matter or its constituents. It will not do merely to throw all doubts on the side of the rejection of a water as has been more or less advocated by writers on water analysis; for there are often interests of too serious character involved in such rejection to admit of its being decided on, save upon really convincing evidence of its necessity.

The analysis is essential, but may be accepted as conclusive only when supplemented by the revelations of the microscope in biological investigation and illuminated by the knowledge to be furnished by a sanitary survey and the practical tests of sickness and death rate. Only by continuous observation and frequent analyses, corrected by the work of the sanitary inspector, will communities take the steps necessary to secure a wholesome water supply and to preserve its sources from pollution. It is purposed to maintain this surveillance over the water supplies of the State institutions, and in these the records of sickness and mortality, which may be obtained with greater certainty and completeness than in communities, will afford a practical test of the value of such surveillance.

The immediately preceding observations borrow increased significance from the text of the last few pages of the report proper. In illustrating the generalization that "the aggregate of organic matter furnished by the tributaries of the Illinois river in their natural condition may greatly exceed the aggregate furnished by the population of their respective watersheds or than the aggregate which passes Joliet in the canal and Desplaines river," it is not made sufficiently clear that the standard of wholesomeness or unwholesomeness of a water may not be fixed solely by the results of the chemical determinations. The nature and source of the organic matter contained must be taken into account, and the neglect to do this may be unintentionally, but, nevertheless, quite seriously misleading. This is now seen to be the case with the illustration noted—pages xxx, xxxiii. In the final report, when all the data shall have been considered and each factor be given its due weight, the general tenor would suffice to prevent any misinterpretation of such a passage.

Sundry typographical errors, incident to the haste with which these pages have been prepared and put through the press, will not escape the notice of even the least critical. Fortunately these are of minor importance and do not affect the general accuracy nor impair argument or conclusion.—April 3, 1889.—J. H. R.

---

Due acknowledgement will be made in the completed report to a number of volunteers who have greatly assisted in the work by observations and in other ways.



PRELIMINARY REPORT TO THE ILLINOIS STATE BOARD OF HEALTH.

---

WATER SUPPLIES OF ILLINOIS  
AND THE  
POLLUTION OF ITS STREAMS.

---

BY JOHN H. RAUCH, M. D., *Secretary.*

---

With increasing density of population, and more particularly with continuous occupancy of soil, certain questions intimately connected with the problem of healthy living press upon the general attention and impose additional responsibility upon those charged with the protection of the public health. By the act of the General Assembly creating a State Board of Health for the State of Illinois, this Board is entrusted with the "general supervision of the life and health of the citizens of the State." It is charged with the responsibility and endowed with "authority to make such sanitary investigations as it may, from time to time, deem necessary for the preservation or improvement of the public health."

Under this authority and in the discharge of this duty, the sanitary investigation of the water supplies of the State, and the study of the sources, extent and means of remedy of the pollution of its rivers and streams, have been pushed during the past twelve months with more vigor and on a much broader scale than have been heretofore practicable with the means at its command.

This investigation and study were among the earliest efforts of the Board, although they were at first necessarily confined to pressing emergencies; and it will be useful to give a resumé of the report of the Secretary on this subject made to the Board during the first few months of its existence. This document was prefaced by the following extract from his report on Drainage made while Sanitary Superintendent of the city of Chicago in 1869:

"From the results of drainage and other sanitary measures carried on in this city, it may be inferred that the judicious

expenditure of money for sanitary purposes is a sound maxim of municipal economy, and from past experience I am satisfied that the mean annual death-rate can be reduced to 17 per 1,000 by continuing in force the present sanitary and drainage regulations, thereby making Chicago one of the healthiest cities in the world."

This was written at a time when the average annual death-rate of Chicago was over 24 per thousand. Within the subsequent decade the average annual death-rate had been reduced to 18.48 per thousand, and in 1878 it had fallen to 16.5, or less than the predicted 17 per thousand. Since that period the death-rate has fluctuated with a general upward tendency, so that the average annual mortality for the last ten years is over 20 per thousand. To what extent this is due to increasing density of population and other causes, it is not now proposed to inquire; the fact itself lends significance and importance to the work of the State Board at present in hand, and points to conditions which affect the welfare of the State at large and of every city, town and village within its borders.

The first report of the Secretary embraced the general results of over twelve years of previous study, and specifically of investigations begun under the auspices of the Board in October, 1877,\* covering the amount and sources of the Chicago sewage, its flow through the canal and extent of dilution, effects of varying lake levels, force and direction of wind movement, temperature, precipitation and other meteorological factors, and chemical investigations of waters collected at various points between Lake Michigan and Peoria. The following prefatory paragraphs are given in full as showing the comprehension of the importance and magnitude of the undertaking at that time. The report was addressed to the Illinois State Board of Health:

GENTLEMEN:—In pursuance of your instructions, and in the sanitary interests of the State, I have devoted all the spare time that I could to the consideration of the pollution of streams, and especially to the effect of the Chicago sewage on the Illinois river.

The following report, which is submitted at this time because immediate action is necessary, contains the substance of my investigations and the conclusions arrived at thus far; but it is only preliminary to a more comprehensive one which I design to submit to you at a future time.

The factors connected with the drainage of Chicago, through the Illinois and Michigan canal, are many and of a diversified character. To accurately determine the relative effect of each, as meteorological changes occur during the year, requires the closest study and involves much labor. The importance of the subject cannot be overestimated, for it involves the sanitary well-being and comfort of at least one-third of the population of the State. I have also conducted similar investigations with regard to the pollution of the Sangamon river, from which the water supply of the city of Springfield is obtained, and of the Cahokia creek, at East St. Louis.

---

\*The State Board of Health was organized July 12, 1877, and in addition to its functions with reference to sanitary matters, it was also charged with the enforcement of the Medical Practice Act, which took effect simultaneously with the act creating the Board.

## A SKETCH OF EFFORTS MADE TO CLEANSE THE CHICAGO RIVER.

From the earliest days in the history of Chicago, the Chicago river has attracted anxious observation from a sanitary standpoint, and the anxiety has increased with the increased population of the city and the suburbs, especially since the river has been the receptacle of a large part of the sewage. When a more perfect system of sewerage became imperatively necessary for the health of the city, the widening and deepening of the Illinois and Michigan canal to the capacity of a ship canal was suggested as a means of at once facilitating the commerce of the city and lakes and purifying the river. The one was urged as a proper national enterprise, and the other as a vital necessity for the increasing population of the locality. In July, 1860, the Sewerage Commissioners of Chicago recommended that the canal be enlarged and deepened so as to create a constant current from Lake Michigan into the Illinois river, but their suggestion was not deemed necessary at that time. The pollution of the river increased, however, beyond all expectation, not only by reason of the increase of population, but from other causes. Among the latter was the increase in the slaughtering of hogs and cattle and the packing of meats. In the year 1860, 306,428 head of cattle and hogs were killed and packed, and all of the offal was passed into the sluggish river. In 1863 this business had increased enormously. In that year the number of cattle and hogs slaughtered increased to 1,029,948, and the offal was still swept into the river. There has been a vast increase, year by year, in this business ever since, keeping pace with, or even exceeding, the increasing volume of sewage produced by the rapidly growing population. This accumulation of sewage was partially relieved by pumping-works at the head of the canal; but the relief so afforded could not keep pace with the increase of sewage and offal, and in 1863 a remarkable epidemic of erysipelas occurred, which prevailed exclusively in close proximity to the South branch and to the main river. The great amount of animal refuse thrown into the South branch was supposed to have been the cause of this epidemic. The pollution of the river from these causes increased daily, in 1863 and 1864, and on January 9, 1865, a commission of engineers was appointed "to devise the best plan to cleanse the Chicago river."

This commission presented their report on March 6 of that year, and, after discussing several projects, recommended that, "in view of the facts in the case, the best plan to cleanse Chicago river that we can devise is to cut down the summit of the canal, so as to draw a sufficient quantity of water through it from the lake to create the necessary current in said river." It was urged, as an argument in favor of the proposition, "that the money expended in cutting down the summit of the canal will constitute a part of the expense of enlarging the present canal so as to admit the passage of steamboats of the largest class, an improvement that must soon be made." This plan was adopted, and, in the fall of 1865, the work of deepening the canal was commenced. It was completed in 1871, and, in July of that year, water was admitted at the deep cut from the river. The cut so made at the head of the canal was six feet, and it was computed that at an ordinary stage of water twenty-four thousand cubic feet per minute would flow from the river into the canal.

## EFFECTS OF PUMPING THE RIVER INTO THE CANAL.

From the year 1860 to 1865 the pumps at Bridgeport were only used to supply to the canal such water as was needed for navigation, and their action in purifying the river, though marked and valuable, was only incidental. But in the latter year the Board of Public Works made an arrangement with the Canal Commissioners to utilize the pumping works as much as possible for the cleansing of the river. It happened, however, in that year, that unusual rains kept the river in fairly good condition without this extra use of the pumps. But the arrangement was maintained, and in 1866 the pumping works were in operation for sixty-two days; in 1867 they operated one hundred and fifty days; in 1868, seventy-three days; and in 1869, one hundred days. The amount of water raised eight feet by them in 1869 is estimated at ten thousand cubic feet per minute. The effect of their operation was marked and favorable, but the result was affected by the operation of other causes, which at times aided and at others hindered the purification of the river. These causes were the variation in the lake level, the local rains, and especially the

constant increase of sewage and offal, resulting from the increasing population, and the slaughtering, and other business interests. \* These influences were constantly operating, and it was found necessary to increase the use of the pumps each year, as is shown in the figures stated above, whenever possible, owing to the limited capacity of the canal, which also depended upon the rainfall. As the population increased, and, necessarily, the amount of sewage also, the effect of the pumps in cleaning the river was less marked.

After the water was let into the "deep cut," in 1871, it purified the South branch and the main river, but it was soon discovered that it effected no marked change in the water of the North branch. The latter continued to be so foul that in 1873 the Fullerton avenue conduit was begun, with a view to its purification. About the time the deepening of the canal was completed, the slaughtering business was transferred to the stock yards, whence the drainage is into the south fork of the South branch, and it was soon apparent that the drainage afforded by the "deep cut" and the canal had but little influence in carrying off the drainage of these establishments, though, owing to local and transitory causes, the water in the south fork was occasionally cleansed.

The discussion, which follows in the printed report, of the causes which affect the flow of water from the lake into the canal, the varying lake level, rain-fall, barometrical pressure and consequent wind movement, etc., will be referred to in another connection. But the concluding passages of the report, having reference to a recommendation to the city of Chicago urging the establishment of the pumping works at Bridgeport, may properly be cited at this point. The report concludes as follows:

This will be the first time that the Board has made a recommendation to the city of Chicago in relation to its sanitary affairs. There is another view of the case to which the attention of the municipal authorities of Chicago should be called, which is, that that city has no right to unnecessarily injure the material and sanitary interests of any other part of the State. The community of interests which exists between the citizens of Chicago and the inhabitants of the country lying along the canal and river, forbids the injury of either by the other.

It is but just to state that the plans heretofore adopted for the sewerage and drainage of the city of Chicago have been made with a view to such change as the future might require. The deepening of the canal, which was begun in 1865, was not completed until 1871, so that the relief afforded by that measure was delayed six years from the time when its necessity was recognized. The pumping works can be rebuilt in ninety days. My reasons for recommending this course are that the works will furnish almost immediate relief without great expense, and without interfering with the project of a ship canal, or with any more permanent plan which may become necessary for disposition of the Chicago sewage.

That the oxidation of organic matter is promoted by the process of pumping will be seen by comparing the analysis of specimens Nos. 16 and 17. No. 16 was taken from the mouth of the inlet pipe at the Peoria water works, and contained 83 parts of organic matter in a million parts of water, while No. 17, which was taken on the same day, several hours later, after the water had passed through the works, contained only 54 parts. Specimen No. 19, taken from the Sangamon river, below the paper mill and distillery, and several miles above the Springfield water works, contained 126 parts; while specimen No. 20, taken from the office of the Board at the State House, contained but 73 parts. Specimen No. 28, taken from the inlet pipe of the Springfield water works, on December 1 (1878), contained 86 parts, while No. 29, taken from the office of the Board, contained but 54 parts.

---

\* It is gratifying to be able to here note, that, notwithstanding the enormous increase of the slaughtering business in Chicago within the past few years, the nuisances incident to rendering and utilization of offal have been diminished.

The agency of the pumps in promoting oxidation will be more needed in winter than in summer, because, among other things, in summer the stirring of the water in the canal by the passage of boats promotes oxidation, in some degree at least, but, more importantly, because low temperatures retard oxidation. I remark that any other plan that will afford relief will involve a much larger expense than this will, and much longer time to effect the result. The cost of the pumping works, which were erected by the State in 1859 and 1860, to supply the canal with water for the purposes of navigation, was \$42,158.24. From the statement of their operation, contained in the reports of the Canal Commissioners, I have computed that they raised about ten thousand cubic feet of water per minute eight feet high. The building yet remains, though it is leased to private parties for a short time. I have no doubt that an arrangement could be made with the Canal Commissioners for its use without any expense to the city of Chicago. I am informed that the old lock can be restored at a cost of not more than \$10,000. If the whole expense of re-erecting the works should be \$60,000 or \$70,000, and the expense of operating them should amount to \$100 per day, it would be trifling compared to the benefits which would result. I am satisfied that an equitable arrangement can be made with the Canal Commissioners for maintaining the works. The fall from the head of the canal to Lockport, a distance of twenty-nine miles, is three feet, and the current between those points has a velocity of half a mile per hour at this time. The velocity will increase in proportion as the water at the head of the canal is raised, and the increase will promote the oxidation of sewage. After a careful investigation, I am satisfied that, with fifty thousand cubic feet of water passing into the head of the canal per minute, the main river and the South branch will be purified; that no nuisance will result from sewage at Joliet and below, and that the potability of the water in the Illinois river at Peoria will not be in the least affected from that source. An increase of water to sixty thousand cubic feet per minute would, in my opinion, take in addition the sewage of the North branch after it has once been cleaned out, and would diminish the nuisance in the South fork of the south branch at least three-fourths.

I am informed by practical men that the increase of current in the canal, which would result from this increase of water, would not materially interfere with navigation, because of its increased depth. The lake level is lower now than it has been for a number of years, but, judging by the experience of the past, it will begin to rise within a year, and will continue to rise during a number of years. But no improvement in the condition of the water in the canal and river can be expected from this cause, for the increased flow into the canal which the higher lake level will produce, will not keep pace with the increased sewage.

The Fullerton avenue conduit is now completed, and an experimental test will soon be made. I do not share in the great apprehension that exists in the minds of many with regard to the effect upon the pollution of the water supply of the city of Chicago, if the water is pumped from the North branch into the lake, at present; but I think it probable that, under certain conditions, it may pollute it.\* Pumping water from the North branch into this conduit will necessarily cause a flow of water from the main river into the North branch. How far this will affect the flow of water into the South branch from the main river under existing circumstances, I am not prepared to say; but I do not hesitate to say that when the current is toward the lake, it will be almost impossible to purify the North branch in this way, for the sewage of both the main river and the South branch will then flow into it. The water in the North branch, north of the conduit, is much less foul than that further south, and it is with special reference to the purification of the latter that the conduit was constructed. But under certain conditions it will happen that the effect of pumping will be to draw off the comparatively clean water at the north end of the branch without materially affecting the fouler water below, as when there is a considerable supply of water by rainfall draining into the branch, which does not amount to a freshet, and changes in the lake level from any

---

\*While the Fullerton avenue conduit pumped from the North branch into Lake Michigan, complaint was several times made that the water supply of Lake View was polluted by it.

cause may also produce this effect. Of course, when there is a freshet out of the North branch the operation of the pumps is not needed for its purification. At times when the water is pumped from the lake into the North branch its effect will be to create a current into the main river and thence through the South branch into the canal, diminishing or at times cutting off the supply of water which otherwise flows from the lake into these channels. This will add the sewage of the North branch to that of the South branch.

I have already shown that the current into the head of the canal, under the most favorable circumstances, barely keeps the main river and the South branch in a tolerable condition. The addition of the sewage of the North branch to the South branch would render the lower portions of the latter nearly as foul as the North branch now is. In other words, it would only amount to a transfer of the nuisance and an increase of the nuisance at Joliet and the pollution of the Illinois river. At other times, the effect of pumping water from the lake into the North branch, will be to carry the sewage from the latter into the lake through the main river, and when the current is sluggish to cause the latter and, to some extent, the South branch, to become foul and offensive. Either way, the sewage will at times find its way to the lake. If it is desirable or necessary to prevent this, it can be done by increasing its flow of water from the lake into the canal, and it can be done in no other way.

It is better for the city of Chicago that all the sewage should pass into the canal, but it should be so diluted as to prevent injury to the sanitary condition of the country below. If 60,000 cubic feet of water per minute at the head of the canal will not create the necessary current to effect this purpose, I have only to remark that the amount may be increased up to 100,000 cubic feet, which, according to Mr. Thomas, is the present capacity of the canal. Ever since 1872, the south fork of the South branch has been a standing menace to the health of the city of Chicago. Frequently, when foul odors are blown across the city, characterized by a peculiar sickening, deadening stench, and attributed to the slaughtering, rendering, and fertilizing establishments, it really comes from this source. For the purification of this, which, is one of the foulest bodies of water within my knowledge, various plans have been proposed; among others, the construction of a large sewer and pumping works, for conveying the water either into the lake or the canal. The condition of this water will be appreciated better than any words can possibly describe it by reference to the analyses of specimen No. 1, from the head of the south fork, which contained 539 parts of organic matter in a million, and specimen No. 2, from near the mouths of two sewers, which contained 1,233 parts, while specimen No. 4, from the South branch, before its junction with the West branch and South fork, contained only 74 parts per million. From the location of the old pumping works, on the same side and near the mouth of the South fork, I am satisfied that the pumping works will, to a great degree, purify this water. Specimen No. 3 was taken from this fork at the Archer avenue bridge, some distance from its mouth, and contained only 125 parts, showing the purifying effect of the lake water passing through the South branch to the canal.

All of which is respectfully submitted.

JOHN H. RAUCH, M. D.

To the copy of this communication, as printed in the Second Annual Report of the State Board of Health, is appended the following note by the Secretary:

NOTE.—By direction of the Board a copy of the above report was submitted to the Mayor and Common Council of the city of Chicago, on January 12, 1880, and in order to carry out the recommendations therein contained, an appropriation of \$100,000 was made by the Common Council for the purpose of constructing pumping works at the head of the canal. While the matter was pending before the Council, the subject was widely discussed by the press, the Chicago Citizens' Association and the Engineers' Club; conferences were held between the State and city authorities, and an important convention was held at Ottawa looking to pushing the construction of the ship canal from Lake Michigan to the Illinois river. While this last would undoubtedly afford an adequate

and permanent method of disposing of the sewage of Chicago, (provided, that such canal be made wide and deep enough to properly dilute the sewage,) and while possibly some of the numerous other plans which have been since suggested would achieve the result sought for, I see no reason for modifying my conclusion above given, namely, "that this resort to pumping is the only plan which can be adopted with sufficient promptitude to accomplish the desired end at an early day." It is immaterial whether this pumping be done from the south fork through a canal connection via the stock yards, or by works located at the Ogden ditch and emptying into the Des Plaines river; or, as is specifically suggested, by re-establishing the pumps at Bridgeport. If this last be done so as to secure a capacity of 60,000 cubic feet per minute when desired, the facts and figures cited in the report demonstrate that substantial relief will be secured for some time to come. With the growth of the city and consequent increased production of domestic and manufacturing wastes and refuse, the time will arrive when 60,000 cubic feet per minute will not dilute the sewage to the point of inoffensiveness, but when that time arrives additional works may be constructed at Ogden ditch with a capacity of say 150,000 cubic feet, and with these two systems the sewage of a population of a million and a half may be satisfactorily disposed of. The vital point now is speedy relief from a grave sanitary danger; one which not only affects Chicago, but which either threatens to, or actually does, pollute the water supply of neighboring communities; which seriously menaces the health of the river towns, and poisons the atmosphere many miles south of the source of the evil. Does not Chicago owe it to herself and to her neighbors to act promptly and efficiently in the matter? Can she afford to invite not only epidemic diseases but an increased death rate? Can she afford to still further incur the risk of pollution of her own water supply, and that of her neighbors on the lake? From the data presented in the foregoing pages it seems obvious that only one available remedy exists for these imminent evils, namely, the removal of her sewage, properly diluted, by the water-courses flowing towards the Mississippi river.—J. H. R.

The work thus begun in 1877 was continued individually by the Secretary long after that date; but owing to want of means the services of professional analysts, observers, and other indispensable assistants could not be commanded until the imminence of an invasion of Asiatic cholera led to the appropriation of a contingent fund by the XXXIVth General Assembly\*—subsequently reappropriated by the XXXVth—"to be used only with the consent and concurrence of the Governor, upon the recommendation of the Board, in case of the outbreak or the threatened outbreak of any epidemic or malignant disease \* \* \* and in suppressing outbreaks which may occur and in investigating their causes and methods of prevention; also in special investigations when required by the sanitary necessities of the State."

With the approval of the Governor, the expense of the recent chemical analyses, the collection of samples of water, and the study of the hydrography of the river basins of the State, has been defrayed from this fund, and the results of the work thus

---

\*Owing to the continuance of Asiatic cholera in portions of Europe and in South America having direct commercial relations with the United States, and the consequent danger of its introduction and epidemic spread in this country—a danger which culminated in the arrival of cholera-infected vessels in New York harbor in the fall of 1887—the Board did not feel warranted in recommending the use of any portion of this fund for these investigations. It was deemed prudent to hold the entire amount of the appropriation ready for instant use in protecting the State from an invasion of the disease should it gain a foothold upon our shores. Fortunately this calamity was averted, and meantime the original appropriation lapsed and was covered back intact into the State treasury, whence it was reappropriated by the XXXNth General Assembly as already stated.

accomplished, year by year, have been published in the annual reports of the Board, and in the records of the proceedings at various meetings. The most important of these, prior to this preliminary report on the work of the past twelve months, are to be found in the Ninth Annual Report (for 1886), pages xiii, xiv, xxix, xxx, xxxix—lix, lxiv—lxvi; and in the proceedings of the meetings, January 13-14, and April 21-22, 1887. At the January, 1888, meeting, the quarterly report of the Secretary—after recounting his action in connection with the cholera importations by the steamers Alesia and Britannia, and discussing the question of immigration as affecting the public health—continues as follows:

Turning from this consideration of the subject to our own duty as a State Board of Health, the occurrences above dwelt upon fully justify all the efforts made during the past four years to perfect the sanitary condition of the State, and emphasize the necessity for their further continuance. The results of the unparalleled drought of the past year demonstrate the importance of a vigorous prosecution of the investigation into the sources of and remedy for the pollution of streams and the character of the water supply, not only of cities, towns and villages, but of the country generally throughout the State. Coupled with the chemical and biological examination of water supplies, it is designed to utilize the data obtainable by collecting the various borings made in many parts of the State for coal, artesian wells, gas, &c. These should indicate the character, extent and availability of our sub-surface water supply, and the results of this study and research, while being directly in the line of sanitary interests, will be profitable from an economic standpoint. Only less important than the prevention of disease and premature death thereby, would be the knowledge which should enable the farmers, stock-raisers and others to remedy, as far possible, the results of prolonged dry weather, and to supplement the ordinary sources of supply from the underground reservoirs.

Illinois, though suffering, has, fortunately, been spared the widespread disasters which have been caused by drought during the past year in neighboring States, but the mode of cholera propagation and the extent and severity of a cholera epidemic depending so largely upon the character of the water supply, we cannot rest satisfied until every community in the State is assured of the best attainable condition of this great sanitary necessity. Wherever typhoid fever spreads beyond sporadic cases, and wherever diarrhea and dysentery are unusually prevalent, it is safe to assume that Asiatic cholera may become epidemic if the specific contagion be introduced, and it will be wise to remedy the conditions which cause such spread and prevalence before the graver disease shall get a foothold.

Touching this portion of the Secretary's report, the following resolution was adopted by the Board at this meeting, to-wit:

*Resolved*, That the necessary preparations be made to carry out the recommendations of the Secretary in his Quarterly Report in regard to the investigation of water supplies and the pollution of streams, and also with reference to the sanitary surveys, with a view to placing the State in the best possible sanitary condition during the coming summer.

At the April, 1888, meeting the Secretary reported that—

Work on the investigation of the water supplies of the State has been impeded to some extent by the high stage of water in many of the streams, and lately by the excessive rainfall over large areas. Considerable progress, however, has been made. Time tables for the collection of water supplies at various points—23 in number—between Chicago and Alton have been constructed, so as to make it practicable to follow the



changes, by pollution and purification, in a given body of water from the time it leaves Lake Michigan until it flows past the city of Alton. Reports of the chemical and biological examinations are received in the Secretary's office.

Except with the interruptions noted, samples of water are now collected and examined once a week at Chicago (lake water), Bridgeport, Lockport, Joliet (above and below city), Morris, La Salle, Henry, Peoria, Pekin, Copperas Creek Dam, Havana, Beardstown, Pearl and Grafton, on the main stream; and from the Kankakee, DuPage, Fox, Big Vermilion and Little Vermilion, Sangamon and Spoon tributaries. Samples will also be taken from Alton and East St. Louis (Mississippi river water), and from other points as found necessary in the course of the work, which will continue six months or more.

In each sample the following determinations are made: Total solids, suspended matter, nitrates and nitrites, chlorine, hardness, free ammonia, albuminoid ammonia, oxygen consumption and color and odor. By continuing the work through so long a period, and by making the analyses as fully as outlined, it is hoped that the effect of accidental variations will be practically eliminated. The amount of flow from some of the tributaries is pretty well known, and before the end of the summer it will be known for all, so that we will then be in possession of data complete enough to enable us to give a fair answer to the question. What is the rate of oxidation in the Illinois river in a flow of 400 miles, with sources and amount of contamination, and amount of dilution from tributaries, practically known?

The results obtained thus far in this investigation show the importance of a study of the tributaries. The waters of some of these appear to contain a great deal of decaying vegetable matter. The character of these waters will be thoroughly studied, as an understanding of them is of the highest importance to the sanitary welfare of the communities supplied from such sources. The public water supplies of some of the cities and towns are also being investigated.

The investigation of the underground water supplies is making satisfactory progress—records from some 60 different localities, in all parts of the State, having been already secured.

Reverting to the report of 1879 and its recommendations, it is well known that the pumps at Bridgeport were replaced, after delay from various causes; but the capacity recommended as a minimum ten years ago is not secured even at the present time, and the pollution of the Desplaines and Illinois rivers, and the protection of its own water supply still press upon the attention of Chicago. In 1886, a Drainage and Water-Supply Commission was created, for further study of the subject, and after a year's investigation and the expenditure of some \$70,000 in the collection of data, surveys and examinations, the Commission arrived at substantially the conclusion set forth in the first report to the State Board of Health on the subject, to-wit: "The disposal of the sewage of Chicago, properly diluted, by the water-courses flowing towards the Mississippi river."

In their preliminary report (January, 1887.), the Commissioners outline the main features of the only three feasible methods of disposing of the metropolitan sewage, and give the results of the investigation to date, together with a general conclusion as to the preferable method and an approximate estimate of cost. But they add that they "are not able as yet to give either conclusions or detailed statements of the probable expense regarding all parts of the proposed work, and must defer them until the final report."

This preliminary report was published more than two years ago, and since that time no effort has been made toward the further utilization of the data accumulated, nor has any additional work been done, except that indicated in the following remarks of the Commission—that is to say, the work now being prosecuted by the State Board of Health:

“The proper degree of sewage dilution in the new channel demanded a careful investigation. When sewage is mingled with a sufficiently large quantity of water it not only becomes inoffensive, but readily finds the oxygen, which gradually purifies it. When the surface is covered with ice a greater dilution is necessary for this purpose than at other times when there is a constant replenishment of oxygen from the air. The proposed waterway should, of course, provide immunity from offense at all times.

“The information upon which definitely to decide this question will be given in the final report, as the data have not yet been all collected, owing to the necessity of making actual tests of the oxidization of the canal water under the ice, which is being done for the use of the Commission by Dr. J. H. Rauch, Secretary of the State Board of Health. The summer conditions are presented in his late report on the Water-Supply and Sewage Disposal of Chicago. The result of these analyses will be compared with those of other streams that are also polluted with sewage, in order to show the rate of oxidization with varying degrees of dilution and aeration.”

The connection of the State Board of Health with an investigation which, at first sight, might seem to be purely local will be apparent when it is considered that the sanitary questions involved affect not only the metropolitan area of Chicago but the entire basin of the Illinois-river valley, embracing about one-half of the entire State and nearly two-thirds the total population. But the work of the Board in this direction is by no means confined to the valley of the Illinois; it already covers over 3,500 miles of water-courses—in fact, all the streams in Illinois except the Rock river in the northern and the tributaries of the Wabash and Ohio of the Mississippi below E. St. Louis and as well as the water supplies of all the State institutions and of the majority of the important cities and towns. An enormous mass of data has been secured, embracing over 1000 chemical analyses of various waters under different conditions—showing the total solids, suspended matter, nitrogen in nitrates, chlorine, hardness, free and albuminoid ammonias, and oxygen-consumed determinations; the meteorological conditions for a series of years as to temperature, precipitation, etc.; the physical conditions as relating to questions of sanitary engineering—geological formations, areas of watersheds, inhabitation and other sources of pollution, manufacturing, industrial, etc.; and other factors of the exceedingly complicated problem.

With the working force at the command of the Board it will be the labor of many months to sift, digest and put in avail-

able shape for use this mass of material. It is not known that any work of such magnitude has ever before been undertaken in any country. There has been an immense amount of labor expended in investigating the questions of sewage disposal, water supplies and rivers pollution in England, and royal and metropolitan commissions have been formed for this purpose, with large grants of money and the services of experts in all branches. Similar undertakings have done much on the Continent and especially with reference to these questions as affecting Paris, Berlin, Vienna and other large centres. The results arrived at in the old world have been carefully studied, as well as the experience and investigations in this country; and in this way, by the process of exclusion, the work has been carried on upon the most promising lines, avoiding labor and effort in directions which have been demonstrated to be unprofitable.

Without dogmatizing upon the results which are believed to be settled by the work thus far accomplished, or venturing opinions on all matters of detail—many of which are still *sub judice*—this preliminary report is confined to an outline of the field attempted to be covered and the general principles guiding the investigation. These latter are fairly well set forth in the succeeding discussion of the nature and properties of sewage, its relations to health and disease, and the methods of sewage disposal, based upon the physical conditions of the area under consideration. These conditions are embraced under the general head of hydrographical investigations, which lie at the foundation of all discussion pertaining to the rivers and streams and the water supplies of the interior of the State.

The data for a discussion which shall be sufficient to reach the essential truths in hydrography can be had, but their collation and digestion are very laborious and require considerable time and some expenditure.

Mr. Cooley has undertaken this work for the Board so far as it pertains to the basin of the Illinois river and to that of Lake Michigan—an area of about half the State and that of most immediate importance. It is the intention to complete a report from the material now most accessible, which will clear the ground and define more fully the direction which must be taken in order to collect and utilize all the information which may be had. When this work is completed it will be of more sanitary and economic value and importance than any other physical investigation which can now be undertaken.

The material for a preliminary report has been largely worked over, but at this time, the following matter only has been prepared:

A discussion of the general physical characteristics of the Illinois and Lake Michigan basins with the general effect of inhabitation;

A more detailed discussion of a part of the principal tributary basins;

And a partial report of the distribution and changes in population upon the two basins.

It is intended, as soon as practicable, to complete the discussion of the several tributaries, to complete the population discussion, and to add a discussion of the Illinois Valley proper and also of the physical effects which may be produced by a large and uniform supply of water from Lake Michigan.

It was the intention, and every effort has been put forth, to have this matter in readiness at this time; but the exceeding importance of the conclusions to be reached and the great care and labor, as well as time required to digest the material have made this impracticable. Still, sufficient progress has been made to indicate clearly the general result.

The upper Illinois watershed is underlaid largely by impermeable, non-waterbearing rocks which furnish a scant supply of water to maintain the minimum flow of the streams. The rock is covered largely by unmodified drift deposits, which are impermeable. The consequence is that the streams are fed almost wholly by surface drainage; thus the flow in them is profoundly dependent upon immediate meteorological conditions in regard to rainfall and evaporation. There existed, however, in nature on a large proportion of the area lakes, marshes, bogs, and wet prairies, while timber covered the ridges and higher knobs; and the banks of streams, or those portions of the watershed which were dryest, naturally drained on account of the more permeable surface. All this exercised a reservoir action upon the waters and distributed them more equably to the streams.

Upon watersheds in which the deposits overlying the rock are permeable, and the rock permeable itself, inhabitation produces no material change. Such characteristics do not obtain in the upper Illinois basin except to the most limited extent.

The surface drainage continually going on in the general tiling of the heavier soils, the ditching-out of the sloughs, bogs and prairies and the wholesale reclamation of the great marsh areas by drainage districts, destroy all the natural reservoirs for the equalization of flow to the streams, except those formed by the lakes especially developed upon the watershed of the Fox. In lieu of such reservoirs the surface is generally left more permeable, and to this extent is regulative; but after periods of drought, or even the long dry weather of the later summer so characteristic in this region, this effect is lost, as compared to natural conditions, upon all areas not continuously saturated with water. Upon such areas the effect is radical so far as the impounding of floodwaters and the maintenance of the minimum flow are concerned.

It is current opinion among those living adjacent to the water-courses, that perceptible effects have already occurred. A detailed consideration of all the changes that may be affected by inhabitation within the next fifty years, shows clearly that the

most radical alteration in the flow of the streams will result, and it seems possible to predict clearly what the nature and extent of these changes will be.

From the data set forth in the appendix,\* it is concluded that the flood contributions from the Desplaines will not be largely increased, while the dry-weather flow may be reduced one-half to two-thirds its present amount, and that with certain changes which may be effected in the regimen of the river near Summit, and which do not involve the drainage of Chicago, the maximum may be increased over 70 per cent.

The drainage of the great marsh areas in the Kankakee basin will, however, produce the most profound effects. It is expected that the flood volume will be increased over four times at Mokena, and the low-water volume reduced to less than one-eighth its present amount. At the mouth of the river the flood volume will be about doubled, and the low-water volume reduced to about one-sixth. In addition to this, as the immediate underlying deposits of these marshes are almost wholly sand and gravel and the grades steep, it is anticipated that until these drainage ditches have enlarged and reached a condition of stability in more resisting deposits, great quantities of detritus will be carried to the Illinois.

The effect of inhabitation upon the Fox will be less pronounced than on any other tributary. Still the floods will be sensibly increased and the minimum flow diminished. Mazon river and Bureau creek now run practically dry in some seasons. This period will be simply prolonged and floods increased. The two Vermilions have not yet been considered, but springs from the rock give them some low-water flow which is permanent.

The general effect upon the Illinois will be to increase the floods by 30 to 40 per cent. down as far as the Sangamon, and perhaps to a lesser degree below. The low-water volume will be reduced to say one-fourth or one-fifth its present amount above the Fox; to less than one-half below the Fox; to about one-half between Peru and the lower tributaries; and, perhaps, by a lesser amount in the lower third of the river.

A considerable proportion of these effects will occur within a few years as a result of wholesale reclamation projects. They will be accompanied by an enormous increase in the supply of detritus. This supply will not keep up indefinitely in the future, but at all times it will be multiplied over past conditions, owing to the increase in tillage and the more complete ditching of the lands.

The effect upon the upper Illinois above Utica will be to increase the height, range and frequency of overflow, and perhaps to cover the lands with infertile deposits of sand. This portion of the river has, however, ample declivity and the bed will not be materially choked by such deposits. The effect upon

---

\* The Illinois River Basin in Its Relations to Sanitary Engineering. By L. E. Cooley, C. E.

the alluvial section of the Illinois from Utica to Grafton, 230 miles, will be most profound.

The grade of the river in low water does not exceed 26 feet, or is only about  $1\frac{1}{8}$  inches per mile. When the Illinois is high and the Mississippi low it has been as great as 35 feet, and on the contrary with a low Illinois and high Mississippi backwater sometimes extends to Peoria. In fact, there have been high waters in the Mississippi which would give five feet at Peru if no water went down the Illinois.

The area of the bottoms is about 600 square miles, entirely overflowed in high water to the second bottoms or terraces. In fact, the banks are only about 12 to 14 feet high down to Henry, and from 8 to 12 feet thence to the mouth, while flood heights are double these amounts. Only a small proportion of the entire bottom area is cultivable, a large proportion being in lake, bayou, slough and marsh, and still another portion so low as to be only available for grazing. That these conditions are generally unhealthful it is unnecessary to say.

The natural river has never been able to maintain an effective channel against the washings brought in by the tributaries even when the watershed was unbroken by tillage. The obstruction of the stream by dams has increased the tendency to deterioration which in any event would accompany the inhabitation of the watersheds. The evidence is undoubted that deterioration of the main channel and choking of the beds of streams across the bottoms with local overflows are going on at a rate which is directly noticeable.

All streams of an alluvial character that are adjusted to their work of carrying the detrital supply and of similar volume to the Illinois, have grades several times as great, with their banks built up usually to extreme high water limits, and the velocity required to clear and maintain the channel free from deposits is upward of two miles an hour. None of these conditions here obtain, the Illinois having a grade only comparable to the Mississippi at New Orleans or to the outlets of the great lakes, running deep and with enormously greater volumes so as to give a channel-maintaining velocity.

The ultimate natural effect of the changed conditions in the lower valley of the Illinois, will be to convert it into a continuous marsh, without well defined drainage lines other than a chain of sloughs, except, perhaps, at the lower end, gradually filling up its bottoms until in ages of time it may probably become adjusted to its new labors. It is doubtful if man can counteract these tendencies or more than postpone their consummation without a radical change in conditions.

It is evident that the only stream which will be in harmony with all the requirements is one of such large and constant volume and great depth as will give sufficient velocity to maintain a channel upon the present grade. If we could suppose such large and constant volume to be permanently drawn from Lake Michigan, its results would be wholly beneficial after the imme-

diate temporary effects accompanying its introduction are over. The quicker this is done the sooner will the present deterioration be arrested and the stream prepared for its growing duties as a drain to its watershed.

The first effect in raising the water surface, except immediately at Peru, will be less than that now occasioned by the existing dams and those in process of construction. If the dams are taken out and such improvements made in the bed of the stream, in conjunction with the introduction of a comparatively small volume of water, as will make it useful for navigation, the present conditions will not be reached at any point, and through natural and artificial forces the gradual improvement of the channel will go on, with a certain improvement in flood height and in the condition of the bottom lands. In fact, only by such a plan is there any hope for a permanent reclamation of the lower Illinois valley, or relief from the changed conditions wrought by inhabitation.

Except as to a limited extent of the bottom lands, it is possible to make such alterations in the bed of the river above Utica, as will largely avoid any ill effects from the introduction of a steady and uniform volume, and no doubt this will be the least expensive and most in harmony with public policy. Should a radical improvement be made for a channel of large depth the conditions will be profoundly and favorably changed.

Whether a channel supplying a large and uniform volume of water from Lake Michigan, is now justified or not for the needs of the city of Chicago, it is a serious question whether outside State interests in the near future may not be served thereby as an economic and sanitary provision. There are many large and growing cities situated upon the streams of the Illinois watershed, several of them in the immediate valley. In very few instances are these cities so situated as to make land disposal of their sewage at all practicable and in others only at very large expense. Chemical precipitation thus far has only succeeded in removing about one-half the putrescible matter, the effluent going to the river. So far as science may now determine, the cities of the Illinois valley must, perforce, use the river for sewage disposal.

In the case of the city of Joliet, the natural flow of the stream is inadequate at times to dilute the sewage of a population of 1,500 people, and of less than 5,000 for several months of each year. At Morris, it will in the future be inadequate at times for 40,000 people, and from Peru to the Sangamon for 125,000 population. In some recent dry-weather years, over half the low-water volume down as far as Peoria has come from Lake Michigan, and with it the sewage of Chicago. While the fish have not been disturbed at such times below the Kankakee, except in winter, yet below Peoria the organic wastes from the distilleries and cattle pens so pollute the water as to kill them. It is a question whether the present sanitary condition of the lower Illinois would be not worse if the flow of water from Lake Michigan were excluded.

In a stream largely of surface drainage like the Illinois, it is apparent that the aggregate organic matters contributed annually from the vegetation which grows luxuriantly over its entire watershed, and which has been contributed for ages, is far greater than that produced by all the inhabitants who may live upon it or drain into it, and that so far as its effect on health is concerned this may be just as potent in breeding disease. The analyses of the waters in their natural condition when compared with the total volume throughout the season makes this apparent. It is also apparent that they do not afford a commendably potable water for domestic use.

If a channel for supplying a large volume of water from Lake Michigan is constructed, it is a matter of economy from an engineering standpoint to give it depth rather than great width as far as Lockport and perhaps to Lake Joliet. As has also been shown, the physical conditions of the lower river demand that it be deep rather than wide for effective work; such will be the natural tendency and this may be greatly assisted by relatively slight artificial means. With these two factors fixed, it is probable that the intermediate river will be improved on the same scale.

From the important national features of such a channel and the relations that the lakes may bear to the Mississippi it is not likely that the first efforts will be the end—that the volume furnished may not be greatly increased in time. The consummation of such works if judiciously developed will be wholly beneficial.

Further study of the data already accumulated, and very possibly additional data, will be required to determine with accuracy the limit necessary for the effective dilution of sewage; but enough is now known to make it safe to say beyond doubt that the limit is within the practical means of accomplishment. It is hardly supposable that any body of men responsible for large expenditures would make a mistake in this particular, subject, as they are at all times, to the fundamental law which would render all their expenditure useless in the event of an unsanitary condition resulting. Still it is a matter in which the State Board should be authorized to exercise discretion in the interest of communities whose sanitary welfare may be directly involved.

The distribution of population, to which much study has been devoted, is most instructive and interesting. As sanitary matters relate largely to communities, the increase in town and city growth is significant of the constant need of fuller sanitary provisions. It is also noticeable that the urban population of the city of Chicago is about equal to that of the balance of the State, double that on the Illinois watershed and many times that in the Illinois valley. These facts are matters of deepest interest in considering the necessities of the metropolis and warrant the most liberal spirit consistent with no material impairment of the rights of the lesser communities. If the solution of



the sanitary necessities of one of the most important cities of the country can be made of like benefit to many other communities and of vast importance to the commercial, economic and sanitary interests of a large portion of Illinois, there should be no question as to a wise State policy on the subject. Nor, on the other hand, should there be any risks incurred through action based on imperfect or inaccurate information. The fullest study should be made of all the factors in a problem of such magnitude and complexity.

To what extent this study may be carried can be only faintly outlined in this preliminary report. The nature and properties of sewage, its relations to health and disease and the various methods of disposal all demand careful consideration. Broadly stated, sewage comprises all the wastes of a town which can be carried off by flow in pipe or conduit. What to do with it has always taxed the resources of civilization. To allow it to saturate the underlying soil and the ground water, or to pollute the water supply, is disease breeding. Its unguarded decomposition is neither healthful nor tolerable. The problem has usually been solved in the simplest and cheapest way possible, consistent with the rights of others.

Contrary to popular belief, experience has shown that sewage is not of great value as a fertilizer. Its chief constituents are the animal wastes, in both solid and liquid form, and even the polluting elements of the solids are soon dissolved, leaving comparatively inert matter behind—the ashes, as it were, of the combustion process which we call decomposition. These constituents, the urea principally, undergo easy and rapid decomposition, dissipating the fertilizing elements in the form of ammoniacal gases. By the time sewage can be applied for fertilizing purposes, it has usually lost much of its value. To realize its utility, it should be collected before it becomes diluted with water and then mixed with non-fertilizing elements, and fixed in form to be used at convenience. This has been tried in the pail system for closets, and abandoned—except in small places—for the present system of plumbing in connection with water-carriage and a public water-supply.

For untold ages, since the waters were gathered together, the earth has been clothed with verdure and filled with animal forms—organic life that dies and undergoes dissolution, sending to the air, the soil and the waters the products of decay; how much of life we cannot tell, but the limestone, the marls, the carbonaceous deposits, the residual oils in the rocks and the pent-up gases bear witness to some small fraction. And still the world is habitable.

Sewage, like all other organic matter, undergoes decomposition, and in much the same way. A low-water volume of 90,000 cubic feet per minute in the Ohio river receives the sewage of Pittsburg and Allegheny, and is visibly polluted; after receiving similarly polluting accessions from other towns, the water

is pumped for the public supply of Cincinnati; and when Cincinnati has contributed its filth the water is pumped for Louisville. Minneapolis and St. Paul send the sewage of over 400,000 people into the Mississippi, with a volume of 400,000 feet at low water, and cities and towns below use the water. Chicago sends its sewage to the Illinois, and ice has been cut from Peoria lake for local use and export; if it were much polluted, the melting and subsequent heating would disclose the effluvia to the senses. Pollution disappears with distance and time, and water, earth and air are thus purified. If the supply of water or of earth or of air is sufficient, the results are not greatly different from those obtaining everywhere and constantly, dissolution completing the cycle of all of nature's operations in organic life. It is, in a sense, a question of degree: if we concentrate too much, the results are undoubtedly actively prejudicial to health. But there are gross exaggerations in the statements on this point. We could not live, if all were true that has been written upon the subject.

Decomposition is largely a vital process, bacteria feeding on organic wastes, digesting or reducing to a lower plane, breaking up the complex substances with the evolution of various gases—not unlike the higher types of life, and the products are similarly dangerous if too much concentrated. The gases generated in the vital processes of human life are poisonous, as in a crowded room; and we therefore provide ample ventilation. Finally, in all these vital processes, the complex organic substance is reduced to its inorganic elements.

These lower types, these micro-organisms, are a world in themselves, of different families, groups and varieties, and their growth and multiplication play an important part in the various processes and varieties of fermentation and decay. Their germs are everywhere present to plant organized matter. Heat kills them, and hence we cook meats, vegetables and fruits, and seal in air-tight cases. The desiccating winds of the "far west" sap their vitality, and there meats dry up in the open air without decaying. Freezing renders them dormant for a time. Antiseptics destroy them. The great triumph of modern surgery is the Listerian method of performing operations in a sterilized atmosphere, and using antiseptic washes and bandages, thus excluding or destroying germs from wounds, and avoiding supuration, painful healings and blood-poisoning.

Butter becomes rancid, meat tainted, milk soured,—these are varieties of the vital changes. We use salt or smoke (pyroligneous acid) or cook the substance so that it will keep. Heat, moisture and the presence of oxygen make all organic matter susceptible to bacterial life. When the food is exhausted, the bacteria become capsuled or encysted, as it were; they are then more difficult of destruction, and drift as seed to renew their vital processes wherever the conditions favor. These operations are arrested sometimes from very excess of bacterial products before their food is exhausted. One variety of these changes is

that of alcoholic fermentation. In this sugar is changed to alcohol, and the change is arrested when the alcohol reaches a certain per cent; but the alcohol itself may be reduced by acetic fermentation, to vinegar, a still lower plane, and again to its final inorganic elements. Another type of organism would produce a fermentation and product entirely different.

The ordinary bacteria of decomposition are not of themselves disease-breeders; in other words they do not effect a lodgement or multiply in living tissue through germ laden air that may be inhaled, or waters that may be drank, though they will produce blood-poison in wounds and even death in capital cases where the vital forces are low. The exhalations from an area of active decomposition are offensive, producing in many persons headache or nausea, lowering the general tone of the system, and making it more susceptible or predisposing it to the lodgement of specific disease germs. Decomposition less active and far more offensive and dangerous will go on with an insufficient supply of oxygen. The remedy for all this is greater dilution, greater dissipation, a freer supply of oxygen. The gases from our chimneys are deadly in concentrated form, and for much the same reason, but they are harmless if sufficiently diffused and diluted.

The modern theory of disease is that specific germs effect a lodgment in those organs or tissues that are susceptible from any cause, and destroy or impair their functions or produce lesions, and death ensues from impairment or destruction of organs, or from the poisons generated. If the vital forces be great the disease may "run its course"—that is, the particular substance upon which the bacteria feed will be exhausted or the products which are by them generated will arrest the multiplication of the specific bacteria.

Various causes may lower the vitality and impair the function of a part or pre-dispose to disease, or such pre-disposition may be hereditary, but the disease itself is not hereditary. The point is that the particular parts affected are not up to the proper vital standard,—partially vitalized tissue being attacked by specific bacteria and only devitalized matter by the ordinary bacteria of decomposition.

This theory is based on the fact that a disease incubates and grows, while, if the agency was a simple poison, its maximum effect would be produced without any period of incubation and growth. Several of these specific bacteria—those of typhoid or enteric fever, of consumption, of the malarial fevers, of Asiatic cholera, of malignant pustule, of splenic fever, diphtheria, erysipelas, pyæmia, septicæmia, etc.,—have been isolated and their habits studied, while by analogy the history of others is inferred. Some are indigenous to man; some are shared by the lower animals; some come from vegetable decomposition under special conditions; some spread by contagion and some are specifically infectious; some do not propagate themselves and some proceed from the general infection of the originating cause and

not from the individuals affected. In some cases, the germs have remarkable fecundity under special conditions, but outside their proper or specific environment their vitality is limited.

It may be seen from this summary of the general principles of the present germ theory, that disease may be largely preventable when all these things are fully understood. This is the field of all sanitary work and study at the present time. Consumption is indigenous on heavy soils, with a high ground-water plane; marshes and vegetable decomposition in stagnant water, cause malaria; typhoid or enteric fever is generally communicated through drinking water, as are also the diarrheal and dysenteric disorders; while diphtheria is often due to defective house plumbing; and so, in various ways, are the causes of all zymotics assigned with more or less certainty.

The general theory of disease thus given is by no means fully accepted nor can it be until investigation in a very difficult field has progressed much farther. It is the extreme view, however, so far as disease may be preventable by purely sanitary agencies. For the purposes of this investigation it is not necessary to develop it beyond its application to sewage and sewer gas as media for spreading the germs of specific disease, and to this extent the theory possesses a working value which fully justifies the outline of its salient points presented in this connection.

In the investigation of specific bacteria they are isolated and cultivated in solutions of beef tea or other nutrient, carried in gelatin. Plates are prepared covered with a film of the nutrient, and the fluid containing the specific bacteria is drilled thereon in rows. Their multiplication is shown by the liquefaction of the gelatin and can be studied under the microscope. If a single *bacterium termo*—the ordinary agent of decomposition—by accident gets on the plate, the culture is destroyed: it will multiply so fast and is so hardy that the specific germ stands no show whatever. The plain and very important inference is that the *bacterium termo* is the wolf among these low forms of life and that in his habitat, or in any area of active sewage decomposition, no specific germ can survive, much less propagate. If this is so, then in any place of active decomposition, or after decomposition has begun and is partially completed, or after it is entirely completed, there is no danger of specific disease, except so far as has already been alluded to in discussing decomposition. The history of such places seems to bear out this inference. If it were not so life could not be sustained in their vicinity.

The danger of sewage as an agent of zymosis is comprehended before that point—active decomposition—is reached. The specific bacteria may infect the house connections and may reach the sewer, possibly the main; but as soon as an area of active decomposition is reached they are disarmed and destroyed. In Chicago the sewage undergoes decomposition in the mains, and sewer-gas passing back through the house-connections may carry

the specific germs into the dwelling; but ordinarily they probably do not get far in this direction. The danger is in the vicinity of the habitation. In rain or floods, sweeping everything out rapidly, there is danger of their being carried a long distance away and infecting the water supply. The dejecta of one typhoid-fever patient thrown upon the snow of a watershed, when melted in the following spring, has been known to infect the water-supply of a town and produce over 1200 cases. But the researches of Prof. Lester Curtis, M. D., who has made the biological investigations in connection with this work, fail to reveal the presence of any specific disease germs in the waters of the Illinois and Michigan canal or in those of the Desplaines or Illinois rivers and tributaries.

The nuisance occasioned by the pollution of watercourses has in recent years demanded other methods of sewage disposal, as by "broad irrigation" or sewage farms and by chemical treatment. The merits of both these methods have been greatly exaggerated, and they are never applied except under compulsion or when nothing else is available. They have never made any return on the large investments required and have rarely paid operating expenses.

The soil underlying cities becomes polluted; cess-pools saturate the ground in the vicinity; filth accumulates in and upon the soil. Sanitary literature is filled with instances of the pollution of drinking water from such causes, often at considerable distances and in the most unexpected manner. This, in a sense, is crude land disposal and it is always dangerous. It is argued, however, that when it is done systematically on a sewage farm that the method is perfect.

The fact is the soil must be suitable, and be handled in the most judicious manner. Pure sand will not dispose of sewage any more than a brass strainer. It simply clarifies, and the effluent is otherwise unchanged. In time organic matter will accumulate so as to furnish a nidus for bacteria, and when the sand is fully charged—in other words, becomes a soil—it will accomplish its work. Impermeable soils simply accomplish surface decomposition by air exposure, a method which is, certainly, as bad as can be devised. When broad irrigation is used in application to crops as needed, great areas are required and enormous distributing systems, much greater than it is practicable to provide for or to reach from large cities. And this must be supplemented by filtration-beds for use when irrigation is not required.

In the filtration plan the ground must be carefully prepared at large expense, and the amount that can be applied is strictly limited or a nuisance is created, and the land should rest in alternate years to rot out. The crops that can be raised are limited in variety, and much greater than the market demand. In a financial sense, both broad irrigation and intermittent filtration have been disappointing to their promoters, although they may be very useful resources for sewage disposal in needful

cases or under especially favorable conditions such as obtain in Edinburg, where the Craigentenny meadows have been used for broad irrigation in a crude way for over 200 years.\* Both in Paris and Berlin attempts are made to dispose of the sewage in this manner—*i. e.*, by broad irrigation and intermittent filtration—but the results are unsatisfactory in the French capital; while, notwithstanding the exceptionally favorable conditions, there are already grave doubts as to the wisdom or expediency of longer relying upon this plan for the disposal of the Berlin sewage. The Royal Commission on Metropolitan Sewage Discharge, in its final report, summed up the question in the following terms as applied to London, and they are substantially applicable to all large cities:

“On the whole, therefore, with regard to broad irrigation, we are of opinion—

“1. That, generally speaking, it offers a satisfactory mode of disposal of sewage, where circumstances admit of its application.

“2. That it offers the most likely means of realizing some portion of the value of the sewage.

“3. That when properly arranged and carefully conducted, the effluent will be effectually purified, but that under careless management the purification may be incomplete.

“4. That it need cause no danger to health.

“5. That with proper care, when applied on a moderate scale, it need cause no serious nuisance to the surrounding neighborhood; but that if improperly managed nuisance may arise, and may become considerable.

“6. That there may be a danger of the pollution of subsoil waters.

“7. That to apply broad irrigation to the metropolitan sewage near the outfalls would be a matter of great difficulty. on

\* As this Edinburg illustration is often cited by the advocates of the land disposal of sewage, it is worth while citing the best authorities on the subject. The English Local Government Board Report of 1876 spoke of the case as follows:

“The Craigentenny meadows afford the strongest example of pecuniary success in the rough and ready use of crude sewage to produce rank crops of grass. The case must, however, be considered with all its surroundings. The crude sewage flows down from the older part of Edinburgh without stint or charge towards land having little value in its natural state, as it is for the most part blown sand from the adjoining estuary. The sewage is received at a point sufficiently elevated to allow of its gravitating on to the land to be irrigated, the effluent escaping down to the boundary line of the sewage farm, which is the sea. The land is of low value as agricultural land, the sewage is abundant, far more than is required for the area irrigated; it costs nothing to the proprietor of the land, and its use, its abuse, or its waste, is under no local control; it is applied in the cheapest way, and the crops are put up to auction in one acre plots every year, the purchaser cutting and removing the grass at his own cost. The mode of irrigation is uncleanly and rude, and there is undoubtedly at times an offensive smell from the carriers, from the rudely trenched irrigated surface, and from the effluent water. During the winter the sewage is allowed to flow direct into the sea.”

Dr. Letheby in his book of 1872, said: “On the Craigentenny meadows at Edinburg, where large results have been achieved, all sanitary considerations are abandoned, and the sewage is allowed to flow upon the ground in such enormous quantities as to convert the locality into a stinking morass, which is a public nuisance; besides which the effluent water is so foul as not to be admissible into any decent water course, and therefore runs directly into the sea. These meadows have long been notorious as the most filthy and offensive plots of cultivated ground in Great Britain. It is clear, therefore, that the Edinburg example cannot be considered as any guide for the cases most likely to occur in practice, where the principal object must be to provide a means of getting rid of the pollutions and nuisances caused by sewage, to which the realization of profit must be only subsidiary.”

account of the enormous quantity of land required, its great probable cost, and the powerful opposition that would be raised against such a purpose.

"8 That for these reasons we do not recommend any attempt to supply this system as a remedy for the evils of the metropolitan sewage discharge."

For small towns, where suitable land is available in sufficient quantity within a reasonable distance; where the storm-water is excluded from the sewage; where the effluent may be properly disposed of; where there is no danger of contaminating the subsoil waters by percolation nor other water supplies by surface drainage; where scrupulous care may be continuously exercised and an adequate "plant" is provided—under such circumstances this system should give fairly satisfactory results. But even at Pullman, where the most favorable conditions obtain the permanent and unqualified success of the experiment is open to question.

Chemical treatment is also much misunderstood. It accomplishes only partial purification. Various precipitants are used—lime ordinarily—which simply coagulate and throw down the albuminoids along with any suspended matter. The effluent has still from forty to sixty per cent. of putrescible matter and will undergo secondary decomposition. Oxidation *per se* is not yet a commercial process, being applied only in the laboratory in analyses of sewage or on the broad scale of nature's operations.

The sludge precipitated from sewage by chemical treatment has not realized any special value as a fertilizer. By the use of filter process and other treatment it has been endeavored to make it more available, but without material success. It is given away, piled up and gotten rid of in any way possible in foreign cities. If it has no value there it certainly will have none in this country in the immediate future.

Water disposal may become a nuisance the same as land disposal and for very much the same reason—inadequate provision. When the oxygen dissolved in water is in excess so as to accomplish normal decomposition, the gases are resolved into their simplest forms; when the oxygen is deficient—in other words, when the degree of dilution is adequate—offensive and more dangerous gases are generated; it is analogous to imperfect combustion by which smoke is produced. The most powerful agent to disassociate such gases is sunlight, but in heavy weather or in the dark they may continue to offend remotely. The oxygen in the water is removed slowly by contact with the air, but not with sufficient rapidity to supply any original deficiency. The appearance of sewage-polluted water changes radically when the oxygen is exhausted and the margin between a bad condition and one comparatively good appears to be narrow.

The attempt to decompose sewage rapidly by aeration has not been successful. As decomposition is largely a vital process it is apparent that it cannot be stimulated beyond a certain rate.

In other words, time is an essential factor. Were oxidation the sole agent, then it would undoubtedly be accomplished much more rapidly.

Running water in a river of large proportions rapidly diffuses the sewage and brings it in contact with the oxygen and the supply is more readily maintained by all the water, as it flows, coming successively in contact with the air. In lakes the diffusion is much slower, liquids not mixing with that rapidity nor in the manner characteristic of gases. It is now becoming a settled dictum of sanitarians, that "sewage is decomposed by the influences acting in running water and leaves only its skeleton in the form of the inorganic chlorides."

The writer, whose words are here quoted, has fallen into an error which it seems necessary to correct, mainly because of the authoritative character of the work in which it appears. In the article "Water," in the Reference Hand-Book of the Medical Sciences (Vol. VII, page 714,) occurs the following:

Dr. Rauch, of Illinois, (Proceedings State Board of Health, 1886,) makes even a greater claim upon our faith than Professor Leeds. He holds that experiments conducted in his laboratory demonstrate that the sewage of Chicago is so nearly destroyed in a canal flow of thirty-three miles to Joliet, that, if the same rate of purification held good below that point, no trace of the sewage would be found ten or twelve miles farther down. Subsidence, he considers to have had little to do with the purification, as the passage of boats necessarily nullified its influence; and there was no dilution of the contents of the canal, as little or no rain fell during the period covered by the observations. The quantity of water which carried away and thus effectually disposed of this sewage of a city of 500,000 inhabitants, is stated to have been about 45,000 cubic feet per minute. "Over one-half the sewage-pollution disappears before reaching Lockport, twenty-nine miles below Bridgeport; and nearly one-third of the remainder is lost in the next four miles, the increased rate of purification in this distance being due to the mechanical agitation of the water by falls, wheels, lockage, etc., and the greater extent of surface exposed to aeration by the union of the canal and the Desplaines river." These statements would be of immense importance were they sustained by collateral evidence; but, unfortunately, those analysts who have had much practical experience in following the track of sewage in its passage down stream, will recognize in these results: 1, The analysis of a fresh and turbid sewage at the starting point, the solid particles of organic matter giving a high rate of impurity; 2, the analysis of a partly sedimented sewage as those particles disappear from the water; and, 3, the dilution effected by the Desplaines river.

For the benefit of the "analysts who have had much practical experience in following the track of sewage in its passage down stream" it should be stated that—1. The analysis itself, showing 12.563 parts of free ammonia per million, is that of anything but "a fresh and turbid sewage at the starting point"; on the contrary it is a sewage in an advanced stage of decomposition; 2, "sedimentation" in a current with the velocity of that in the Illinois and Michigan Canal is a physical impossibility, and this entirely apart from the influence of the passage of boats; 3, it is expressly stated in the text quoted that there was "no dilution of the canal," which contents were the sole subject of the various analyses at Bridgeport, Lockport and Joliet; as a matter of fact the Desplaines river above the point of junction with the canal had ceased to exist as a watercourse



during the period under observation, and the contents of the canal were undiluted from any source after leaving Bridgeport until several miles below Joliet. Since this experiment has been thrice repeated in the recent work—in the winter of 1876-7, in the summer of 1888, and again within the past three months—the original report is here appended for convenience of reference.

RATE OF PURIFICATION, BRIDGEPORT TO JOLIET—SUMMER OF 1886.\*

Advantage was taken of the remarkably dry season to determine the rate of purification of the water in the Illinois and Michigan canal and in the Illinois river during June, July and August. As shown by the preceding table, the rainfall was so light up to the middle of August that the contents of the canal from Bridgeport to Joliet, where it unites with the Desplaines, were practically unaffected by dilution. The conditions were as though the experiment was conducted in a laboratory. Whatever purification occurred between the points mentioned was due to sedimentation and oxidation, and mainly to the latter, since the passage of boats would interfere with the former.†

During a tour of inspection accompanying the Governor, on May 30 and June 1, the attention of the Secretary was attracted by these conditions, and preparations were at once begun for taking advantage of the opportunity presented. Some delay occurred in securing collections of the water at points below Joliet, and it was not until June 26 that the first samples were collected, and then only from Bridgeport, Lockport, Joliet, Ottawa and Peoria.

[A table, embracing details of 62 chemical analyses, which follows in the report, is here omitted as containing much matter not bearing upon the point under discussion.]

The following table gives the averages of the different analyses of samples collected at each place on the same day:

PLACES.	Free Ammonia.	Alb'm'd Ammonia.	Oxygen used.
	In 1,000,000 parts.		
Bridgeport.....	26.563	1.633	26.20
Lockport, 29 miles below.....	12.733	.753	11.01
Joliet, 33 " ".....	9.426	.432	9.34
Ottawa, 81 " ".....	.413	.213	5.30
Peoria, 159 " ".....	.027	.194	4.81

The respective percentages of loss shown in the following may be taken as the measure of the rate of oxidation in the canal during the summer months, unaided by dilution:

PLACES.	Free Ammonia	Per cent of loss.	Alb'm'oid Ammonia	Per cent of loss.	Oxygen used.	Per cent of loss.
	In 1,000,000 parts.					
Bridgeport.....	26.563	.....	1.633	.....	26.20	.....
Lockport.....	12.773	52.1	.753	53.9	11.01	58.0
Joliet.....	9.416	26.1	.432	42.7	7.34	33.4
Total per cent of loss between Bridgeport and Joliet.....	64.6	.....	70.36	.....	72.0	.....

\* Ninth Annual Report, Illinois State Board of Health.

† It should be noted that the current in the canal, nine-tenths of a mile per hour, is of itself sufficient to prevent sedimentation; and numerous dredgings of the bed of the canal show no traces of sewage subsidence.

The different ratios of loss of free ammonia and albuminoid ammonia are accounted for by the partial conversion of the latter into the former. The measure of the purification is indicated by the means of these losses,—that is, about 70 per cent in 33 miles. In other words, over one-half of the sewage pollution disappears before reaching Lockport, 29 miles below Bridgeport, and nearly one-third of the remainder is lost in the next four miles, the increased rate of purification in this distance being due to the mechanical agitation of the water by falls, wheels, lockage, etc., and the greater extent of surface exposed to aeration by the union of the canal and the Desplaines river.

During the period of 42 days covered by the examinations of which these are the means, there were only 3.04 inches of rain, while the average amount for the corresponding period during the preceding 15 years is 5.14 inches, and during the corresponding weeks in 1885 there were 3.15 inches, or more than four times as much. From February 1 to August 15 it was so dry that the light rains during the six weeks under consideration were quickly absorbed by the earth or evaporated before reaching the streams. As before remarked, there was no dilution of the contents of the canal between Bridgeport and Joliet, 33 miles,—and the loss of sewage pollution must be attributed to oxidation.

If the same average rate per mile obtained after leaving Joliet, the pollution of the canal by the sewage of Chicago should disappear within the next 10 or 12 miles, or at about Channahon. An examination made by the Secretary on June 1 corroborates this estimate. There was no evidence of sewage pollution, discernible by the senses, in the canal below the Kankakee feeder, which is three miles below Channahon and 48 miles from Bridgeport. The purification of the Desplaines is even more rapid than this, owing to its shallow, wider and more broken flow insuring more perfect aeration.

It is stated that an average of about 45,000 cubic feet per minute was being pumped from the river into the canal during this period. Whatever the quantity it is obvious that if the volume of dilution had been increased by 20 per cent. the contents of the canal would have been entirely inoffensive to the senses on reaching Joliet—not alone through the increased quantity of oxygen this additional 20 per cent. of water would contain, but also because of the improved condition of the river and its branches which would result from the continuous removal of the sewage and foul wastes.

#### RATE OF PURIFICATION, BRIDGEPORT TO OTTAWA—WINTER OF 1886-87.

During the months of December 1886, and January, 1887, an investigation was made to determine what effect low temperature and the freezing over of the Illinois and Michigan canal and the Desplaines and Illinois rivers had upon their pollution by Chicago sewage. During the period under observation the canal was frozen over fifty-six days and the rivers about fifty days.

Soon after the canal was frozen over there was an increase of the pollution at Joliet compared with the observations made last summer, and on the 9th of December it was observed at Ottawa where none was found when the examinations were made in June, July and August. The pollution continued to increase until the maximum was reached on the 27th of December at Joliet, and about January 4 at Ottawa. This increase, however, was not alone owing to the ice and low temperature, but the fact that an accident occurred at the pumping works at Bridgeport, while they were being tested before acceptance from the contractors by the city, so that practically, no water was pumped from December 7 to 27, inclusive, as shown by an examination of the following table, giving the difference in depth in the canal and Chicago river.

During this period, when the canal was not frozen over, only about 17,000 cubic feet of water per minute passed through by gravity, and when frozen over only about 15,000 cubic feet.

On the afternoon of December 27, the pumps were set in motion, and until the end of January about 50,000 cubic feet per minute was pumped from the south branch of the Chicago river into the canal. There was a marked decrease of organic matter in the water at Joliet on January 1. This decrease continued until the end of the month when the quantity of organic matter was less than at any time for the seven months previous. From January 4 to the end of the month there was also a marked decrease of organic matter at Ottawa.

At Peoria a small amount of sewage was observed on January 8; this increased until the 23d, but entirely disappeared on the 29th.

It has been estimated that it takes water from Lake Michigan to reach Peoria—when at a low stage—about twenty-five days. With the ice covering during the period under investigation the pollution by Chicago sewage was not manifest at Peoria until about thirty days after the pumping ceased early in December. This was no doubt partially owing to the fact that during December only 1.76 inches of rain fell, and of this .90 of an inch was snow, practically having no effect in increasing the quantity of water in the Desplaines and Illinois rivers. The pollution disappeared from Peoria in about twenty-one days from the time it was first noticed. This latter effect was no doubt largely owing to the result of the increased velocity caused by the pumping of 50,000 cubic feet of water per minute from the 27th of December to the last of January. This is probably the first time since the construction of the pumping-works that Chicago sewage has reached Peoria. On January 11, 1.37 inches of rain fell, and this, in addition to the melting snow, caused freshets in some of the tributaries of the Desplaines and Illinois rivers and no doubt affected the chemical determinations of the samples of water collected at Joliet, Ottawa and Peoria on that day.

The following table gives the averages of the analyses of the different samples collected at each place on the same day:

Places.	Free Ammonia.	Albuminoid Ammonia.	Oxygen used.
	In 1,000,000 parts.		
Bridgeport.....	9.7	3.7	22.4
Joliet, 33 miles below.....	6.5	2.2	11.3
Ottawa, 81 miles below.....	4.7	.75	9.0
Peoria, 159 miles below.....	1.7	.43	6.45

The result of these observations shows that, with the canal covered over by ice, oxidation was retarded in the proportion indicated by the smaller losses of 32 per cent. of free ammonia, 40 per cent. of albuminoid ammonia, and 50 per cent. of oxygen used—as compared with the losses shown under the exceptional conditions which obtained in the previous summer. A more nearly accurate conclusion may be reached by a study of the following tables which give the means of 347 analyses embracing eight determinations instead of only three as in the foregoing investigations. These means are grouped for the summer and winter work respectively with the same purpose of exhibiting the effect of low temperature and ice cover excluding free atmospheric effect and retarding flow.

## MEANS OF ANALYSES—MAY TO OCTOBER INCLUSIVE, 1888.

Places.	Number of Analyses.....	Total Solids...	Suspended Matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....
Bridgeport.....	29	471.2	129.20	.000	46.811	201.3	12.253	2.558	23.113
Lockport.....	24	431.2	69.80	.000	46.120	207.7	10.882	1.990	16.230
Joliet.....	26	442.7	107.90	.000	43.658	216.8	8.932	1.681	14.301
Morris.....	24	355.9	30.85	.380	32.149	214.8	4.107	.707	10.920
LaSalle.....	23	345.7	50.30	1.037	19.717	211.7	.636	.526	8.558
Henry.....	19	306.0	27.50	.683	17.660	204.4	.467	.481	8.657
Peoria.....	19	329.75	54.27	.8915	12.358	199.7	.210	.522	9.769
Pekin.....	16	353.0	84.30	.795	16.152	204.6	.645	.650	9.410
Havana.....	25	301.78	45.4	.731	11.583	204.2	.342	.430	8.142
Beardstown.....	24	390.0	84.7	.62	7.524	204.9	.202	.380	7.354
Grafton.....	12	301.6	50.5	.582	9.205	242.4	.095	.483	7.300
Alton.....	15	278.6	75.2	.....	4.083	169.4	.166	.356	7.356

## MEANS OF ANALYSES MADE DURING 1889.

Bridgeport.....	9	576.6	27.2	0.00	62.934	.....	8.925	2.896	26.502
Lockport.....	8	408.6	24.6	0.00	56.083	.....	8.149	2.489	22.820
Joliet (Dam 2).....	8	452.8	55.5	0.00	57.717	.....	8.488	2.606	21.717
Morris.....	8	325.2	29.1	0.00	28.748	.....	4.716	1.587	10.696
LaSalle.....	9	417.6	93.8	.942	13.105	.....	1.456	.637	8.582
Henry.....	5	316.0	30.9	.962	11.691	.....	1.059	.404	8.626
Peoria (Upper Bridge).....	6	331.0	26.9	.510	12.860	.....	1.637	.549	9.611
Pekin.....	6	352.0	43.5	1.259	11.792	.....	1.591	1.015	13.358
Havana.....	9	354.4	80.8	.414	9.277	.....	1.078	.585	9.234
Beardstown.....	6	317.8	56.3	.966	6.933	.....	.762	.357	5.505
Grafton.....	9	410.8	44.6	.087	*7.523	.....	.875	.722	9.818
Alton.....	8	309.9	61.3	.317	5.834	.....	.422	.396	7.562

The necessary careful study of these data, with due consideration of the numerous factors, has not been practicable in the period which has elapsed since the last samples of water were collected—March 11, 1889. What results may be obtained and what new light thrown upon the problem can be partly inferred from the following discussion, which illustrates the generalization made on a preceding page, to-wit, that the aggregate of organic matter furnished by the tributaries of the Illinois river in their natural condition may greatly exceed the aggregate furnished by the population of their respective watersheds, or than the aggregate which passes Joliet in the canal and Des-plaines river.

The volume of water passing LaSalle for about eight weeks in May, June and July would average about ten times that passing Joliet, or 480,000 cubic feet per minute. Of this, about five parts come from the Kankakee, or would show analyses similar thereto, and about four parts would be similarly ascribed

\*This is the mean of 10 determinations—excluding those of January 14 and 21 for the reasons assigned by the chemist in his report.—See Appendix, p. 28.

to the Fox. The following table gives the mean results of the analyses for Joliet, the Kankakee, the Fox, and the Illinois at LaSalle:

	Chlorine.....	Free Am- monia.....	Albuminoid Ammonia..	Oxygen Consumed..	Number.....	Relative Vol- ume.....	
Joliet.....	45.52	9.30	1.39	13.77	9	1	Desplaines river.....
Wilmington.....	1.36	0.08	0.59	14.43	7	5	Kankakee river.....
Ottawa.....	4.24	0.12	0.47	6.84	8	4	Fox river.....
LaSalle.....	8.57	0.15	0.46	9.61	8	10	Illinois river.....
Aggregate.....	69.39	10.20	6.26	113.18	.....	10	Weight proportioned to
LaSalle.....	86.15	1.47	4.62	96.10	.....	10	volume.....
	-15.76	8.73	1.64	17.08	.....	.....	Absolute loss.....

A brief study of this table leads to very important conclusions. The analyses only give percentages, or density, and the result must be multiplied by the volume flowing, in order to obtain the absolute amounts passing any given point. The oxygen consumed represents the percentage of readily decomposable matter. It is apparent that the amount of organic matter coming from the Kankakee is more than five times that passing Joliet. In like manner, we find that the amount contributed by the Fox is more than twice, and, for the watershed above LaSalle, over seven times that passing Joliet.

The analyses from the Kankakee show an increase in organic matter in high water, so that the mean results for the six months shown in the detritus table (see appendix) should be less than that for the year. The mean discharge for the Kankakee for the entire year is probably 300,000 cubic feet per minute, so that the aggregate organic matter contributed is probably six to seven times that passing Joliet. The mean discharge for the basin above LaSalle is about 700,000 cubic feet per minute. Considering the analyses of the Fox and Big Vermilion, it would appear that the organic matter brought in by land-water is ten to twelve times that passing Joliet. These results can be stated with far more accuracy when the hydrographical work is completed.

Referring again to the table, the line noted as "aggregate" shows the absolute amounts, as compared to that at Joliet, found by multiplying the amounts given for Wilmington and Ottawa by the relative volume, as given in the last column, and adding the result to Joliet. The oxygen determination we have already discussed. The albuminoid ammonia is assumed to measure the nitrogenous matter, or that which is regarded as especially obnoxious. It will be perceived that the contribution coming in with the land-water is over  $3\frac{1}{2}$  times that passing Joliet. The absolute amount of chlorine has increased. This is a fixed substance, increasing steadily with the amount of animal wastes, and perhaps by the leaching of salt from the land or from springs.

If the LaSalle determination be multiplied by ten, the relative volume at that point, it will show the absolute amounts. These show a decrease, or that the absolute loss of organic impurities is greater than the total amount passing Joliet. In other words, notwithstanding the contribution passing Joliet, by the time LaSalle is reached the aggregate organic matter is less than the aggregate furnished by the several tributaries as they reach the Illinois valley.

The following table is entirely similar to the preceding, but gives the results of eight weeks of low water in the latter part of July and in August and September. The volume passing LaSalle was about 96,000 cubic feet per minute, or double that reaching Joliet from Chicago. Of the land-water, one-half came from sources that would give analyses similar to the Kankakee, and the other half is represented by the Fox:

	Chlorine	Free Ammo.	Alb. Ammo.	Oxygen Cons'd	No.	Relative Value.	
Joliet .....	39.87	8.63	1.72	12.39	10	1	Desplaines river....
Wilmington .....	0.64	0.14	0.56	10.95	9	$\frac{1}{2}$	Kankakee river.....
Ottawa.....	6.36	0.10	0.45	5.90	7	$\frac{1}{2}$	Fox river.....
LaSalle.....	22.13	0.27	0.55	8.34	8	2	Illinois river .....
Aggregate....	43.39	8.75	2.22	20.77	.....	2	Weight proportion- ed to volume.....
LaSalle .....	44.26	0.54	1.10	16.68	.....	2	
	-0.87	8.21	1.12	4.09	.....	.....	Absolute loss.....

If this table be compared with the preceding it will be seen that the proportion of organic matter is greatest in the higher stages of the river. It will be also apparent that the proportion of nitrogenous matters as shown by the albuminoids and the chlorine is greatest at low water. The absolute loss in organic matter, as shown by the La Salle analyses, is about 20 per cent. as compared to about 17 in the preceding table; and in albuminoid ammonia, some 50 per cent., as compared to about 26 per cent. The absolute amount of decomposition is, of course, much less, but also much greater in proportion to volume of water.

So far as a chemical valuation is concerned, it is apparent that two or three times the water at Joliet would give a stream containing a less proportion of organic matter than the most of the tributaries of the Illinois. If Bridgeport be the point compared, it would take four or five times. Any such statements must, however, be qualified, as the sewage would come in a less decomposed condition, and it is impracticable at this time to say what proportion of water removing the sewage promptly from Chicago would be required, so that the stream shall not contain a greater proportion of organic matter than exists from the natural conditions. All that need be said is that the analyses seem to imply the possibility of reaching this standard.

It must be remembered, however, that the constitution of this matter is different in many respects from that derived from the land, being more largely of animal origin and far more readily decomposed. For this reason it purifies much faster than the land water; in other words, the organic matter does not travel so far in the stream as that of more purely vegetable origin derived from the land. For this reason, also, a larger proportion of dilution is demanded in order to furnish the supply of oxygen for the more rapid decomposition. And for this reason, also, the chemical tests of water from the lower Illinois are likely to show more favorably when a large supply of water is turned in from Lake Michigan than under their natural conditions.

The land waters are already taxed to dispose of the organic matters contained therein, and to this extent are not available for sewage dilution. The analyses show that the waters of Lake Michigan contain only from one-sixth to one-twelfth the organic impurities contained in the waters of the Illinois and its tributaries. The freedom from organic matter and the high percentage of dissolved oxygen preëminently fit lake water for the dilution of sewage, and it is far more effective for this purpose than any land water from the Illinois watershed.

As to pronouncing definitely at this stage of the investigation upon the one best remedy for existing pollution or recommending the adoption of any specific plan proposed—that is not now warranted. Although the work thus far done under the direction of the State Board of Health is sufficient to determine the general principles of the solution of the drainage problem of Chicago much remains to be done by that city itself before the value and importance of some of the factors can be fixed with scientific accuracy. The actual sewage product of the metropolitan area now tributary to the Illinois and Michigan canal and thence to the Desplaines and Illinois rivers is not yet known—it is only a matter of rough estimate. It is reasonably certain that this estimate is over rather than under the actual amount; but any plans based upon mere estimates are subject to revision in practice, and such revision may involve serious modification.

Furthermore, it is not yet known, from any investigation made by the Chicago Drainage Commission, what the rate of sewage decomposition really is in the sewers themselves before the sewage is discharged into the stream; nor what changes in the density of the drainage pumped at Bridgeport will be produced by establishing a circulation in the south fork at the stock yards. Chicago should at once set about the work of gauging the sewer flow and the determination of the rate of sewage decomposition both within the sewers and in her river and branches, and should complete the special study of the south fork already begun under the Commission. When these data have been added

to the information previously acquired, it will remain to digest and interpret the facts as the basis for the final plans and estimates.

The work done under the direction of the State Board for the Illinois river basin, outside of Chicago proper, and that done in connection with the water supplies of cities and towns and of state institutions has already reached this stage. Substantially all the data necessary to the intelligent treatment of the problems involved in the improvement of the water supplies and in the prevention or limitation of river pollution have been accumulated. There is required some further investigation, mainly local, of the hydrography of the basin and, very probably, some additional analyses to clear up a few moot points raised by abnormal determinations in some of the analyses already made will be necessary.

With these additions the material for a final report on the water supplies of two-thirds of the State, and the sanitary problems of the drainage of its most important river basin is ready for use, and it is purposed to push the work thereon with all practicable dispatch.



# CHEMICAL INVESTIGATIONS

## OF THE

### WATER SUPPLIES OF ILLINOIS, 1888-89.

Made by Prof. J. H. Long,

Under the Direction of the Illinois State Board of Health.

---

The following report embraces the preliminary results of the analyses of over 750 samples of water collected by the State Board of Health between May 1, 1888, and March 15, 1889, at Chicago (Lake Michigan); Bridgeport, Lockport and Joliet (Illinois and Michigan Canal); Morris, Ottawa, LaSalle, Henry, Peoria, Pekin, Copperas Creek, Havana, Pearl, Beardstown and near Grafton (Illinois river); Channahon, Wilmington, Ottawa, LaSalle and Chandlerville (from tributaries of the Illinois river); East Dubuque, Rock Island, Quincy, Alton, East St. Louis, St. Louis, Chester and Cairo (Mississippi river), and from smaller streams and supplies to towns and public institutions at Decatur, Kankakee, Galesburg, Elkhart, Lincoln, Jacksonville, Pontiac, Elkhart, Springfield, Belleville, Aurora, Cairo, Joliet, Chester, Bunker Hill, Elgin, Freeport, Galena, Danville, Anna, Marseilles, Monticello, Morrison, Bloomington and Normal.

Over 650 of these tests were made between May 1 and November 15, and about 100 between January 14 and March 15,—these latter chiefly of waters of the Illinois river.

Of each water, a two-gallon sample was collected according to the following directions, which were printed on the back of the shipping tags furnished to each collector:

“Clean the jug thoroughly as follows: Fill with water and allow to stand a day or more; pour out most of the water, add some clean sand and shake thoroughly, to remove anything adhering to the walls of the vessel, then rinse out the sand and fill and rinse several times with water similar to that to be sent. Finally, fill with the water (leaving air space) and close with a good close cork. Tie this down with a piece of strong muslin.”

The samples were forwarded to me at 40 Dearborn street, Chicago, and were numbered immediately in the order in which they were received. The chemical examinations were begun as soon as possible, and those constituents liable to change by standing were determined first.

Of the large number of samples sent, but two or three were lost by breakage of jugs or other accident. In a few cases the tests gave evidence that the jugs had not been properly cleansed, and in several other instances the amount sent was too small for all the tests.

On the whole, however, I believe the samples were properly taken and very promptly forwarded. They were delivered to me by the express companies in Chicago without delay.

In the work of analysis I have been ably assisted by Mr. Mark Powers, Mr. J. J. Link and Mr. C. E. Linebarger, to whom my sincere thanks are due.

## METHODS OF ANALYSIS.

Many volumes have been written on the subject of water analysis, and while little difference of opinion exists regarding the determination of the ordinary mineral constituents of a water, there is still much discussion as to what tests are best to show the amount and nature of the organic matters present; in other words, to measure those substances on whose presence or absence the value of a water for household purposes depends.

Formerly the difficulty of the subject was not recognized as clearly as at present, and chemists were accustomed to furnish very exact figures for the amount of organic matter in a water. For a time it was customary, I might almost say *fashionable*, to report organic matter as crenic or apocrenic acid, and to several places of decimals. In many cases the amount of this organic matter was measured only by loss on ignition of the residue left on evaporation.

But chemists now recognize that the organic matter in water is usually of very variable and complex nature, consisting of products of which we, in many cases, know absolutely nothing.

It is known that certain organic matters, which may find their way into water, are capable of producing a great deal of mischief when taken into the stomach, even in small amount; while it is just as certainly known that other organic matters may be present in drinking water in much larger amount and still be comparatively harmless. Unfortunately, to distinguish between these different kinds of organic matter in a water is a problem of great practical difficulty, as the *absolute* amount present is usually quite small, and in a state of gradual change. But since the complex and variable nature of this organic matter has been admitted chemists have ceased to try to estimate it as a whole, but have turned their attention to the detection and measurement of certain derived products and to certain empirical reactions which experience shows characterize good or bad waters.

It is on the subject of the value of these empirical tests that great differences of opinion exist. The present investigation was undertaken to determine the general character of a large number of samples, some of which were supposed to be good, some very bad, while of many the condition remained to be found by the tests. A good portion of the work consisted in a study of the Illinois river and its tributaries, the object of this being to show the influence of the Chicago sewage poured in at the source of the stream, and to determine, if possible, the rate of destruction of this polluting matter in the flowing water.

During the latter part of the season the question of supply to the state institutions was taken up, it being thought desirable to determine the general character of these waters, many of which had never before been examined.

In no case was a full mineral analysis thought necessary, consequently the work was confined to such tests as show the main features of the water and its hygienic value. I believe, in the present state of our knowledge, this information can be best given by the following determinations:

Total solids by evaporation.

Suspended matters.

Chlorine.

Nitrogen in nitrates and nitrites.

Hardness.

Free ammonia.

Albuminoid ammonia.

Oxygen consumption.

Because of the interest shown by physicians and sanitarians throughout the state in this investigation I think it proper to explain somewhat fully the methods employed in the various tests.

## TOTAL SOLIDS.

Many of the waters received were very turbid. It was therefore necessary to

thoroughly shaken and then without delay a liter or half a liter was poured out for the test. The solids in this portion were determined by evaporating in a platinum dish on a water bath, the bath being large enough to accommodate six of these dishes, holding 200 cubic centimeters at one time. On the completion of the evaporation the dishes were transferred to an air oven kept at a temperature of  $110^{\circ}$  C. and left there for half an hour. They were then cooled quickly and weighed. Subtracting from this weight the known weight of the dish the solid contents were found. When one liter of water was evaporated the weight in milligrams was taken as the number of parts per 1,000,000, as the specific gravity could be practically taken in most cases as unity.

#### SUSPENDED MATTER.

After pouring out the water for solids the jug was again thoroughly shaken and another portion of one liter was measured out in a flask and transferred to a tall beaker. This was covered and allowed to stand several days until the solids in suspension had completely settled. Most of the clear liquid was then poured off and the residue, with the sediment in the bottom of the beaker, was filtered on a Gooch filter, the last portions being washed out with distilled water. This filter renders most excellent service here; many waters which certainly could not have been filtered clear through paper were successfully filtered through asbestos with this appliance.

The filter and contents were dried at  $110^{\circ}$  C., as before and weighed. The difference between this weight and the former gives the weight of solids in solution, supposing the same volume of water taken for each test.

#### CHLORINE.

For the chlorine test three liters was the amount usually taken. This was evaporated to a small volume in a porcelain dish. The residue was treated with a slight excess of pure nitric acid and filtered. In the filtrate the chlorine was found by the Volhard method, using a deci-normal solution of silver nitrate and equivalent solution of ammonium sulphocyanide.

In a few cases less than three liters was taken for the chlorine test. In the samples from the canal at Bridgeport, Lockport and Joliet one liter, or less, was usually sufficient, and in several of the artesian waters 100 cubic centimeters was found enough for direct titration without concentration.

#### NITROGEN IN NITRATES AND NITRITES.

The value of a determination of nitrates and nitrites in drinking water has long been a vexed question, and, unfortunately, different chemists hold widely different views on the subject. By some the test is held to be of the highest importance, while others look upon it as of no use whatever. As is very often the case a middle course seems the best one to take here. Nitrates and nitrites of a water come from the final oxidation of nitrogenous organic matter in it, and thus serve as an indication of past contamination. These final products of oxidation are perfectly harmless in themselves, and in fact a great many waters containing them can be safely used. This is especially true of very deep wells where they are nearly always present. In shallow wells, however, they must always create suspicion, as other matters originally associated with what gave rise to them may not have been so fully oxidized.

There are several methods by which the nitrogen of nitrates can be estimated in water. In one of these—the Marx method—the water is evaporated to a small bulk and treated with an excess of pure strong sulphuric acid. To the hot mixture a solution of indigo is added as long as the color is destroyed, indigo in sulphuric acid being completely decomposed by nitric acid.

If the strength of the indigo solution had been previously found by treating a known nitrate solution (of saltpeter, for instance) in the same way, the volume used by the water residue becomes a measure of the nitrate in it. The method gives good results as long as certain precautions, chiefly suggested by Warington, are followed. But with these precautions it is pretty slow and could not be well applied in this investigation.

Another method is based on the fact that the nitrogen of nitrates in alkaline solution is readily converted into ammonia by action of nascent hydrogen. To apply this to water a definite quantity is evaporated to a small bulk and transferred to a distilling flask or bulb. A combination of metals known as the zinc-copper couple is added and distillation begun. The zinc and copper act as an electrical pair and liberate hydrogen. This reduces the nitrates or nitrites to ammonia which is distilled off and tested as will be explained below.

Sometimes the water residue is rendered strongly alkaline with pure sodium-hydrate solution, and then a piece of aluminium foil is added. This dissolves in the alkali with liberation of hydrogen, which reduces the nitrates, as before.

These methods are not quite as convenient or accurate as another one which I have followed in all the tests carried out. When a solution of a nitrate is made strongly acid with pure, strong sulphuric acid and brought in contact with certain metals, nitrogen dioxide is produced by decomposition. When the gas is collected without loss it becomes a measure of the amount of nitrate decomposed. This method has been applied to water analysis by Frankland, Warrington, and others. In using it, I proceeded in this way: After weighing the residue from the determination of total solids, I treated it with a little pure water to dissolve all that was soluble. The liquid was filtered into a small beaker, the insoluble part being washed with several small portions of pure water. The contents of the beaker were then reduced to a small bulk—two or three cubic centimeters—by evaporation on a water bath, and transferred to a Lunge nitrometer containing mercury. Twice the volume of pure, strong sulphuric acid was then introduced and the mixture shaken, gently at first and then vigorously. This brings the mercury in contact with the liberated nitric acid, if any is present, decomposing it to nitrogen dioxide. After the gas cools by standing, its volume can be measured and reduced to corresponding weight. The nitrometer employed had a capacity of fifty cubic centimeters. In a few cases it was found necessary to repeat the experiment, as the volume of water taken gave more nitrogen dioxide gas than could be measured.

#### HARDNESS.

The hardness of a water is usually measured by its soap-destroying power. In every case I found it by means of a standard soap solution, of which one cubic centimeter precipitated the equivalent of one milligram of calcium carbonate.

In the river waters, 100 cubic centimeters was the amount taken for the test, and soap solution was added until, after thorough shaking, a permanent lather was obtained. In the case of some of the well waters, 50, 25 or even 10 cubic centimeters, diluted to 100 with distilled water, was found, by a preliminary trial, to be the right amount to take. The soap solution was made by dissolving about 10 grams of good castile soap in a litre of weak alcohol, and adjusted by comparing with a standard lime solution made by dissolving 1 gram of pure calcium carbonate in hydrochloric acid, evaporating to dryness and dissolving in water to make a liter.

The soap solution was diluted so that 11 cubic centimeters were required to give a permanent lather, with 10 cubic centimeters of the lime solution diluted to 100. Allowing 1 cubic centimeter for the amount necessary to form a lather with pure water, the remaining 10 cubic centimeters just precipitate the equivalent of 10 milligrams of calcium carbonate. It is difficult to obtain constant or regular results with this test in waters containing much suspended or organic matter. It was not employed in the examination of the last 100 samples.

#### FREE AMMONIA.

The determination of free ammonia in a water is often of the greatest value. As a general thing it represents one of the last stages in the decomposition of nitrogenous organic matter, and its amount is sometimes a rough measure of what has been decomposed. It must be remembered, however, that this free ammonia is perfectly harmless itself, in the amount in which it occurs in water, and often when very abundant can not be taken as an indication of any present or even very recent contamination. In most

stage of oxidation. In most artesian well waters, free ammonia appears abundantly, and generally unaccompanied by organic matter except in very minute amount. Hence, the conclusion drawn from the free ammonia found in a sample of water depends largely on the source of the latter,

The test is carried out as follows: 500 cubic centimeters of the water, or in bad cases 10, 25 or 50 cubic centimeters diluted to 500 with pure distilled water quite free from ammonia, is poured into a carefully cleansed retort connected with a long Liebig's condenser. About 5 cubic centimeters of pure strong sodium-carbonate solution and a small amount (half a gram) of coarsely powdered and freshly ignited pumice stone are added to the contents of the retort, which is then warmed by means of a water bath. After about ten minutes the latter is removed, the retort dried, and then heated directly by a Bunsen burner until distillation begins. By the preliminary warming on the water bath the chief danger of cracking the retort with the lamp is avoided. Bumping in the boiling liquid is completely prevented by the addition of the pumice stone. The heat must be so regulated that the distillation proceeds rather slowly, about 50 cubic centimeters in 15 minutes being a good rate. In the presence of sodium carbonate the free ammonia is readily driven off with the steam, which must be condensed in the Liebig apparatus by a good current of cold water. The distillate, collected in four portions of 50 cubic centimeters each, contains practically all the free ammonia, and it remains to measure its amount.

The distillate is caught directly in four tubes of exactly the same size, made of clear thin glass with a mark to indicate the 50 cubic centimeters. To each tube 2 cubic centimeters of Nessler solution is added. The Nessler reagent is a solution which has the property of striking a deep yellowish brown color with weak ammonia solutions, the depth of shade depending on the amount of ammonia present.

The first of the above named tubes should show much the deepest color, the second and third less, while the fourth should be practically without color. If it is not, another 50 cubic centimeters should be collected and tested in the same way. The amount of ammonia in each one of these tubes is estimated by duplicating the shade by means of ammonia solutions of known strength. For this purpose a standard ammonium chloride solution is prepared which contains the equivalent of .01 milligram of ammonia in each cubic centimeter. Definite volumes of this are diluted to 50 cubic centimeters with pure distilled water, and then treated with the Nessler reagent. In this way a series of colors is obtained indicating certain small amounts of ammonia in 50 cubic centimeters, and by making a number of tests those obtained from the four or five distillates can be exactly duplicated. The known ammonia in the duplicates shows immediately the amount in the distillates or, in other words, in the volume of water taken.

#### ALBUMINOID AMMONIA.

This is a name given by Wanklyn to ammonia produced by distillation of nitrogenous organic bodies with a strong oxidizing solution of potassium permanganate and potassium hydrate. Many organic matters distilled with this solution are decomposed, giving up their nitrogen in the form of ammonia, and this is called albuminoid ammonia because albuminous bodies are types of those readily decomposed in this way. Albuminoid ammonia, then, does not exist already formed in a water but is produced from it by the laboratory process through the rapid oxidation of the complex matters it contains. If these matters were allowed to decompose spontaneously they would give rise to free ammonia in time which could be detected by the test given above.

We can, therefore, look upon the laboratory oxidation as a substitute for the slow, natural oxidation, although it is not probable that exactly the same amounts of ammonia are in any case formed by the two processes from similar materials.

To understand the meaning and value of the indications given by this test, it is necessary to consider what takes place when albuminous or similar substances undergo spontaneous decomposition. Unfortunately, many of the steps in such decompositions are obscure, but it is known that among the products found we have at some stage indol, skatol, leucine, tyrosine, aspartic acid, peptone, various fatty acids,

and other bodies of the aromatic group. Ordinary sewage added to watery solutions of aluminous bodies is an excellent agent to bring about most of these decompositions.

The products named have generally definite composition, and often crystalline structure so that they can readily be obtained in condition for exact investigation. Such investigations, as carried out by Tiemann and Preusse, for instance, have shown that the nitrogenous products in the above list give up practically the whole of their nitrogen as ammonia when distilled with the oxidizing solution.

It is now well known, although formerly a different view was held, that *fresh* albuminous or similar substances are not completely decomposed in this manner.

The intensity of the reaction, therefore, which the chemist obtains by application of the albuminoid ammonia test to a water contaminated with these complex nitrogenous matters, depends largely on their state of preservation, in other words on time and temperature, as both are important factors in producing decomposition.

Another very important contamination in waters to which sewage has access, is urea. Wanklyn states that this substance yields no ammonia by the albuminoid process, while other chemists show that a portion of its nitrogen is given off in this manner. Tiemann's experiments indicate that all the nitrogen may be obtained in this way.

My own experiments indicate that with strong permanganate solutions the urea is rapidly decomposed, giving off most of its nitrogen in the form of ammonia. If, in the purification of the permanganate by long boiling, a portion is changed to manganate, the decomposition of the urea is slow and much less perfect.

Hair, wool and gelatinous substances contain matter similar to albumin in composition, and are decomposed in the same general way, but not as readily.

Fæcal matter consists of undigested food, containing more or less substance of albuminous nature along with products of its decomposition, as indol and skatol. Also mucus, epithelium, biliary products and numerous substances in small amount, about which little is known. The nitrogenous portions of this matter can be classed with those already mentioned which are decomposed wholly or partially with evolution of ammonia by the alkaline permanganate solution.

The determination of albuminoid ammonia, then, gives us a rough measure of the amount of readily decomposable nitrogenous matter a water may contain, and to be of value, should be studied in connection with the source of the water, its temperature and distance from possible contamination.

Practically the test is carried out in this way: To the residue left in the retort after the distillation of the free ammonia 50 cubic centimeters of the permanganate solution is added. This is prepared by dissolving 9 grams of purest potassium permanganate in distilled water and adding 225 grams of good potassium hydrate and enough water to make 1,500 cubic centimeters in all. The solution is then boiled down to 1,000 cubic centimeters in order to free it from ammonia. With the grade of potassium hydrate employed I find no difficulty in making a good solution in this way.

After adding the alkaline permanganate the distillation is begun again and four more portions of 50 cubic centimeters each boiled over. These are tested exactly as before. In some cases it is necessary to continue the distillation even further to secure all the ammonia.

A fuller discussion of some of the points of this process will be found below where I explain the results obtained by the actual tests.

#### OXIDATION TESTS.

Early in the history of sanitary water analysis, attempts were made to measure organic matter present by the amount of oxygen it consumed under certain conditions. Forehammer first proposed to accomplish this by treating the water with a dilute solution of potassium permanganate as long as its color was destroyed, but this plan gave only crude results. Much better results are reached by several modifications of this process, notably by that of Kubel. In this the oxidized water is boiled with an excess of dilute permanganate solution for a definite time, after which the amount of the oxidizing salt not acted on is found by means of oxalic acid.

The solutions required are:

Potassium permanganate, 320 milligrams in 1 liter.

Oxalic acid, 630 milligrams in 1 liter.

Sulphuric acid, 2 volumes of strong *pure* acid to 1 of water.

The acid and permanganate solutions are exactly equivalent to each other; that is, the permanganate is decolorized by an equal volume of the other.

To make the test 100 cubic centimeters of the water are measured into a clean beaker, 5 cubic centimeters of the acid and 10 of the permanganate are added, after which the solution is quickly brought to the boiling point and boiled five minutes. If the color is all destroyed a new trial must be made, using 20 or even 30 cubic centimeters of the permanganate in some cases.

At the boiling temperature a part of the permanganate is decomposed, giving up its oxygen to the organic matter in the water. At the end of the five minutes the amount of the salt not decomposed is found by use of the oxalic acid solution. This could be accomplished by adding the latter to the hot liquid in the beaker until the color is just destroyed and noting the volume required for this; but it can be more accurately done by adding at once 10 cubic centimeters of the oxalic acid, which destroys all the color; then add, drop by drop, the permanganate until a trace of pink color just reappears. Subtracting 10 cubic centimeters from the total volume of permanganate used we have that required for the organic matter. Each cubic centimeter so used gives up .08 milligrams of oxygen, which is commonly referred to as "oxygen consumed." The test is empirical and does not give absolute results. Many organic substances do not seem to be decomposed at all in this way. Urea is one of these and many others suffer only partial decomposition. It has been observed, however, that partially decomposed bodies react more strongly on it than do the substances from which they were originally derived. Fresh white of egg in dilute solution has a much less marked oxygen-consuming power than is shown after the solution begins to putrify. This recalls some peculiarities of the albuminoid-ammonia reaction.

The test tells us nothing about the character of the organic matter which it indicates, and does not distinguish between comparatively harmless vegetable contaminations and more dangerous ones of animal origin. In fact, vegetable matters seem to react very strongly with it, and, besides this, it is affected by nitrites, frequently present in waters, as well as by organic matter.

Notwithstanding these weak points in the method, its results have considerable value, especially when considered in connection with those of other tests, and it frequently aids materially in forming an opinion about a doubtful sample.

With these explanations about methods of analysis, I pass now to a consideration of the results obtained in the actual work.

#### LAKE MICHIGAN WATER, CHICAGO.

The water supply of Chicago is taken from Lake Michigan by means of a tunnel running two miles out from the shore line. Nearly 100,000,000 gallons daily are pumped, and work is now in progress on another tunnel, which is to be extended to a point four miles from the shore. This will furnish a greatly increased supply. The general character of the water is shown by the following analysis made in my laboratory a few years ago. The mineral constituents of the water are practically constant. In parts per million, the results obtained were:

Calcium sulphate.....	5.30
Calcium carbonate.....	76.50
Magnesium carbonate.....	37.73
Ferrous carbonate.....	.49
Potassium sulphate.....	4.85
Sodium chloride.....	3.86
Silica.....	5.25
Alumina.....	traces
Phosphates.....	traces
Total mineral constituents.....	133.98

Table I. gives the results obtained by the weekly examinations made during the summer. The water was taken from a faucet on the second floor of the building, No. 40 Dearborn street. Departures from the general average are unimportant, except on October 2d. This is explained by the fact that, owing to changes in the pumps and for other causes, the shore inlet was frequently employed about that time. The entrance to this inlet is about 1,200 feet from the present shore line, and in comparatively shallow water. When the lake is rough, foreign matter is easily washed into the pipes. The practice of using this short tunnel, except in cases of grave necessity, can not be too strongly condemned.

The total absence of nitrates and nitrites, the very low chlorine, free ammonia and oxygen consumption are important features of this water. The albuminoid ammonia seems to be no greater in water taken from the crib than in that from point's several miles further out. It is undoubtedly quite constant throughout Lake Michigan.

By comparison with results obtained by Mr. A. W. Smith in examinations of Lake Erie water, at Cleveland, I observe several important differences in the two supplies, which suggests an interesting field of inquiry. The proportion of organic matter in the Lake Michigan water seems to be much less than that in Lake Erie.

TABLE I.—CHICAGO.

Date, 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness Ca Co <sup>3</sup> .....	Free Ammonia	Alb. Ammonia	Oxygen consumed.....	Physical Conditions.	*Mean temperature — Week ending.....	†Total precipitation week ending.....
May 1	141.0	8.0	0.00	2.230	126.0	.006	.064	1.44	Slightly opalescent ...	53.58	.72
" 8	148.0	14.5	0.00	2.290	126.0	.010	.088	1.20	" " " "	51.75	2.04
" 15	143.0	7.5	0.00	2.124	126.4	.005	.085	1.52	" " " "	48.43	.80
" 22	144.5	6.6	0.00	2.230	118.8	.004	.082	1.48	" " " "	50.98	.43
" 29	143.6	9.5	0.00	2.230	126.0	.006	.087	1.12	" " " "	61.43	2.70
June 5	143.4	8.0	0.00	2.230	126.0	.004	.088	1.52	Clear .....	57.62	.46
" 12	140.8	7.5	0.00	2.240	124.0	.009	.093	1.40	" " " "	63.87	.03
" 19	147.4	9.2	0.00	2.180	125.0	.010	.093	1.28	" " " "	74.94	.00
" 26	149.2	7.4	0.00	2.680	125.0	.003	.092	1.12	" " " "	71.87	.24
July 3	148.0	13.4	0.00	2.100	125.0	.002	.070	1.12	" " " "	68.04	1.15
" 10	148.6	13.8	0.00	2.332	125.0	.001	.098	1.28	" " " "	71.00	2.24
" 17	146.7	12.2	0.00	2.003	126.0	.008	.096	1.56	" " " "	69.42	.00
" 24	149.4	16.9	0.00	2.124	125.0	.006	.094	1.52	" " " "	71.57	.29
" 31	136.3	6.0	0.00	2.124	124.0	.002	.082	1.44	" " " "	63.42	1.04
Aug. 7	139.0	6.0	0.00	1.770	125.0	.006	.088	1.36	" " " "	73.45	1.29
" 14	146.5	11.8	0.00	1.888	125.0	.010	.093	1.44	Light floating matter.	65.35	.12
" 21	137.2	4.0	0.00	1.832	125.0	.008	.094	1.52	Clear .....	70.64	.68
" 28	142.5	10.5	0.00	1.416	130.0	.010	.094	1.52	Slight turbidity .....	67.21	.01
Sept. 4	155.6	19.9	0.00	1.649	126.0	.010	.095	1.44	" " " "	65.57	.00
" 11	142.1	6.7	0.00	1.235	125.0	.006	.096	1.52	Clear .....	66.93	.17
" 18	146.8	10.3	0.00	1.770	125.0	.012	.100	1.20	" " " "	57.30	.75
" 25	154.2	5.2	0.00	2.357	125.0	.008	.104	1.44	Slight turbidity .....	60.57	.06
Oct. 2	382.0	227.6	0.00	1.779	127.0	.013	.184	4.32	Very turbid !!!	49.50	.36
" 9	212.0	57.5	0.00	1.888	128.0	.007	.104	1.84	Slight turbidity .....	49.35	.70
" 16	154.8	20.5	0.00	2.832	127.0	.010	.094	1.44	Nearly clear .....	49.71	.36
" 23	167.0	30.1	0.00	2.800	125.0	.010	.076	1.60	Slightly turbid .....	42.57	1.33
" 30	170.0	28.2	0.00	2.336	126.0	.012	.070	1.60	Nearly clear .....	49.42	.20
†Mean..	149.9	13.5	0.00	2.113	125.3	.007	.089	1.42			

\* From a number of points where meteorological observations are systematically recorded, the data of temperature and precipitation (rain or snow) have been obtained. In such cases these factors are added to the statement of Prof. Long's chemical determinations, for the purpose of aiding their interpretation. They help to explain many of the abnormal variations, due to storm water as a local cause of pollution, and also the variations in the rate of sewage oxidation as affected by temperature and dilution.—J. H. R.

† Omitting Oct. 2.



## THE ILLINOIS AND MICHIGAN CANAL—BRIDGEPORT TO JOLIET.

At Bridgeport about 50,000 cubic feet of water per minute is pumped from the south fork of the Chicago River to feed the Illinois and Michigan Canal.

This water, coming originally from Lake Michigan, is mixed on the way with a large part of the city sewage and with the drainage from the stockyards. The sewage from the city is comparatively dilute, and amounts to about 70,000,000 of gallons daily. I have no very certain data showing its composition at the outlets from the sewers, but during the summer season it is doubtless in an advanced state of decomposition, as indicated by partial tests which I made a few years ago in particular cases.

As regards the decomposition in the river itself, the data are almost as scanty. Tests which I made of the water of the North Branch during April last have some value in this connection. Seven samples were taken near Chicago avenue and analyzed, with these results as regards free and albuminoid ammonia:

	Per million.	
	Free.	Alb.
1.....	4.45	2.50
2.....	6.15	1.85
3.....	5.40	2.26
4.....	6.30	3.30
5.....	6.20	3.46
6.....	5.80	3.27
7.....	6.20	2.87
Mean.....	5.79	2.79

Here we have a ratio of 2:1 between free and albuminoid ammonia. Farther north in the stream tests made about the same time gave a relation of nearly 1:1.

At Bridgeport, in the tests made during May, the ratio of 5:1 was usually observed, indicating a larger amount of decomposition in the river itself. It is, perhaps, fair to say that at all times important changes take place in the Chicago River, and that in the summer time many important decompositions are completed here.

The stockyards sewage has been a very important factor in making up the character of the water leaving the Bridgeport pumps. In the summer of 1886 it amounted to about 7,000,000 gallons daily, and gave then by several analyses in parts per 1,000,000:

Free ammonia.....	42.
Albuminoid-ammonia.....	6.4
Oxygen consumed.....	208.

Later tests show a great improvement in the character of this water, which is explained by the fact that it has been found commercially profitable to remove many of the contaminating matters to use in fertilizers, etc.

The water collected at Bridgeport was taken at a point 100 feet west of the pumps, and from the center of the channel. During the period of collection the pumps were in continuous operation, discharging about 50,000 cubic feet, or about 370,000 gallons per minute, or in the day about seven times the amount of sewage flowing into the river from all sources. From the 13th to the 19th of September, inclusive, four only of the eight pumps were in operation. Some of the effects of this are shown by the tables.

The results of the analyses are given in Table II. It will be observed that these analyses show peculiar variations from week to week. Many of these variations can not be accounted for as a number of imperfectly understood factors combine to make up the character of the river from day to day. With a high lake level, for instance, less dirty water flows out from the slips and a clearer mixture reaches the pumps. Sudden changes can also be produced by a heavy rain washing out the sewers, or by passage of a large propel or in the river just before a sample was taken in the canal beyond. Each of these causes would agitate the water and bring a mass of filth in suspension.

TABLE II.—BRIDGEPORT.

Date, 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammoni.	Alb. Ammoni.	Oxygen con- sumed.....	Phy-ical Conditions,	
May	1	1099.0	467.0	0.00	155.700	159.0	29.200	6.800	59.600	Black and dirty; very bad odor.	
"	8	450.0	115.1	0.00	48.140	159.0	11.120	3.700	23.600	Dark with offensive odor.....	
"	15	580.0	28.5	0.00	59.470	242.4	10.760	1.800	22.200	Light colored sediment, odor strong.	
"	22	428.1	76.7	0.00	30.440	219.6	7.720	2.520	22.720	Light colored sediment, order strong.	
"	28	505.5	147.0	0.00	35.400	235.2	8.220	2.080	20.800	Dark, turbid; strong odor.....	
June	5	474.8	75.1	0.00	25.488	230.4	7.700	2.009	21.080	Clearer than usual; odor strong.	
"	12	464.9	132.0	0.00	36.816	210.0	10.480	1.960	21.600	Black; strong odor.....	
"	19	347.5	62.3	0.00	21.240	174.0	7.960	2.920	19.760	.....	
"	26	367.0	155.2	0.00	14.160	192.0	6.120	1.720	18.560	Clearer than usual; odor strong.	
July	6	406.8	84.8	0.00	38.232	216.0	11.240	1.200	19.600	Black; strong odor.....	
"	10	946.4	510.5	0.00	100.536	224.0	19.880	3.640	50.800	Very filthy.....	
"	17	486.5	109.7	0.00	62.304	212.0	16.800	2.760	26.320	Black; strong odor.....	
"	24	347.5	84.5	0.00	27.736	168.0	7.160	2.040	23.740	Dark; strong odor.....	
"	31	754.9	144.5	0.00	181.248	240.0	31.040	1.840	26.560	Dark; very bad odor.....	
Aug.	7	420.3	72.5	0.00	31.152	210.0	9.800	1.800	18.000	Dark; turbid; strong odor.....	
"	14	373.0	49.8	0.00	25.488	192.0	10.000	1.610	20.000	.....	
"	21	325.5	50.4	0.00	25.488	190.0	7.000	3.240	15.520	.....	
"	28	341.2	65.0	0.00	28.320	194.0	8.560	1.360	15.840	Nearly clear; strong odor.....	
Sept.	4	344.7	109.6	0.00	14.160	180.0	6.480	2.840	17.120	Turbid; strong odor.....	
"	11	336.8	65.5	0.00	12.744	168.0	10.400	1.880	14.000	Slightly turbid; strong odor.....	
"	14	447.0	99.0	0.00	29.736	190.0	9.760	3.320	14.560	Dark sediment; strong odor.....	
"	18	583.4	184.2	0.00	76.464	210.0	25.760	2.600	15.680	.....	
"	20	530.0	204.2	0.00	49.560	208.0	21.250	4.960	16.320	.....	
"	25	345.0	93.0	0.00	30.444	180.0	8.760	1.780	11.200	Opalescent; strong odor.....	
Oct.	9	321.0	78.1	0.00	28.320	174.0	11.840	1.680	21.760	Strong odor; turbid.....	
"	16	341.0	58.3	0.00	50.960	200.0	9.760	2.480	30.401	Opalescent; strong odor.....	
"	23	415.2	83.6	0.00	61.152	240.0	9.200	2.600	37.440	Very strong odor; dark colored.	
"	26	499.0	182.7	0.00	42.480	210.0	13.250	2.660	15.520	Very dirty; strong odor.....	
"	30	386.8	157.5	0.00	14.160	212.0	6.920	2.400	24.000	Clearer than usual, less odor than usual.....	
Mean.		471.2	129.2	0.00	46.811	201.3	12.253	2.558	23.113		
1889											
Jan.	14	389.	41	0.00	49.655	.....	9.560	3.480	23.680	N' yel'er; strong odor	Mean 28.3
"	21	365.4	24.	0.00	92.580	.....	11.520	2.840	23.840	Opalescent; slight odor	Tem. 26.1
"	28	340.0	17.	0.00	35.450	.....	6.000	1.680	16.480	N'ly clear; slight odor	Pre. 29.
Feb.	4	313.4	14.	0.00	52.038	.....	3.520	1.980	18.080	.....	28.7
"	11	294.0	23.	0.00	59.118	.....	3.080	1.900	20.000	.....	17.2
"	18	433.0	35.3	0.00	117.528	.....	17.380	5.150	46.400	Slight sed.; str'g odor	22.
"	25	355.4	16.	0.00	39.648	.....	6.760	2.400	36.400	Opalescent; str'g od'r	.96
Mar.	4	481.0	32.8	0.00	56.640	.....	12.720	3.520	27.240	.....	6.5
"	11	420.0	41.6	0.00	63.720	.....	9.760	2.300	26.400	.....	.01
Mean..		376.6	27.2	0.00	62.934	.....	8.925	2.806	26.502		

As compared with the results obtained in 1886, these analyses show several remarkable peculiarities. Of course no fair conclusion can be drawn from single tests, but the averages undoubtedly give us a good basis for comparison. We have here, in parts per million, for the summer tests.

Free ammonia.....	12.253
Alb. ammonia.....	2.558
Oxygen consumed.....	23.113

which gives 4.8:1 as the ratio of free to albuminoid ammonia.

In 1886 the results obtained gave

Free ammonia.....	17.44
Albuminoid ammonia.....	1.195
Oxygen consumed.....	20.580

with 14.6:1 as the ratio of free to albuminoid ammonia. Taking into consideration the irregularities in the tests of 1886, it is probable that a ratio of 10:1 is fairer than that deduced from the averages for the whole season. Even with this correction there still remains a great difference in the result of the two seasons. But after what has been said above I think it is not necessary to look far for an explanation of this.

I have shown in a former report that the rate of sewage oxidation—using this term in its broad sense—depends very largely on temperature, being most rapid in warm weather. An instructive confirmation of the views advanced then is furnished by the cold weather tests tabulated above.

Here we have the ratio of free to albuminoid ammonia nearly 3:1 with increased oxygen consumption and greatly diminished suspended matter. The marked increase in albuminoid ammonia can not, therefore be charged to this.

It will be remembered that the summer of 1886 was unusually warm and dry, so warm that vastly greater amount of decomposition took place in the Chicago river itself, as shown by repeated observations of the South Branch, than was the case during the summer of 1888. The escape of gaseous products of decomposition was very marked in 1886 in the vicinity of Archer Avenue bridge, and everything indicated that the sewage reached the pumps in a more advanced stage of decomposition than during the period of the observations covered by this report.

While the summer of 1886 was unusually warm and the conditions for putrefactive changes most favorable, it must also be said that the winter of 1889 has been unusually mild, so that we do not obtain an exaggerated view of the effects of temperature changes by comparison. In a colder season the ratio of free to albuminoid ammonia would doubtless be less than 3:1.

#### LOCKPORT.

The next tests were made at Lockport, 29 miles below Bridgeport. There is no dilution on the way except by rain. The results of the analyses are given in table III.

TABLE III.—LOCKPORT.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed .....	Physical Conditions.
May 3	538.0	41.0	0.00	77.800	279.0	15.700	3.30	25.12	Very turbid; strong odor.....
" 10	608.5	242.0	0.00	21.240	183.0	8.480	2.72	24.64	"
" 17	692.0	107.0	0.00	69.920	257.2	12.800	1.56	15.92	Light brown; odor plain.....
" 24	468.4	56.9	0.00	35.400	260.4	6.380	1.68	17.44	Milky turbidity; odor strong....
" 31	699.0	80.6	0.00	121.770	268.8	17.300	2.24	22.56	Dark and turbid; bad odor.....
June 7	428.1	64.5	0.00	22.650	228.0	10.120	1.76	17.24	Light colored sediment; strong odor.....
" 14	387.1	58.0	0.00	25.490	213.0	11.400	1.56	12.12	Dark colored; bad odor.....
" 21	322.9	46.5	0.00	28.320	192.0	7.240	1.72	15.76	Dark; strong odor.....
" 27	331.9	47.0	0.00	35.400	200.0	10.500	1.70	16.00	Light colored sediment; strong odor.....
July 19	346.7	38.0	0.00	59.472	215.0	11.000	1.80	18.56	Brownish; odor not strong.....
" 26	342.5	46.7	0.00	32.922	168.0	11.040	1.18	15.36	Light colored; odor strong.....
Aug. 3	489.5	171.4	0.00	28.320	216.0	15.040	2.02	22.40	"
" 9	386.4	48.8	0.00	32.568	204.0	10.760	3.56	13.64	Light colored sediment; strong odor.....
" 16	312.4	31.2	0.00	12.744	188.0	6.920	1.90	14.72	Light colored sediment; strong odor.....
" 23	330.5	32.5	0.00	12.704	180.0	6.640	1.68	15.28	Light colored sediment; strong odor.....
" 30	390.0	45.4	0.00	58.410	190.0	9.840	1.52	18.56	Dark sediment; strong odor.....
Sept. 13	348.8	30.8	0.00	15.576	168.0	9.760	1.80	15.20	Opalescent; strong odor.....
" 15	423.0	39.0	0.00	49.560	180.0	11.760	2.30	12.48	"
" 20	607.0	143.4	0.00	87.732	250.0	19.040	2.06	10.72	Dark sediment; strong odor.....
" 27	358.8	67.0	0.00	33.984	166.0	8.800	2.60	13.44	Opalescent; strong odor.....
Oct. 12	305.4	57.1	0.00	59.470	182.0	9.440	1.86	19.60	Turbid; strong odor.....
" 18	373.6	65.8	0.00	50.965	216.0	10.960	2.28	8.80	Opalescent; strong odor.....
" 25	384.0	53.8	0.00	99.008	190.0	8.880	1.48	6.88	"
" 30	405.0	61.1	0.00	35.400	192.0	11.381	1.54	17.28	Turbid; strong odor.....
Mean... 1889.	431.2	69.8	0.00	46.120	207.7	10.882	1.99	16.23	
Jan. 14	385.4	24.0	0.00	67.260	.....	8.580	2.585	26.72	Opalescent; strong odor.....
" 21	544.0	.....	0.00	73.632	.....	9.228	2.520	23.04	Turbid; strong odor.....
" 28	388.4	19.0	0.00	48.852	.....	6.040	3.080	17.56	Opalescent; strong odor.....
Feb. 4	419.0	41.0	0.00	52.000	.....	5.300	1.960	19.68	Opalescent; slight odor.....
" 11	360.0	15.2	0.00	40.710	.....	6.512	1.960	21.76	Nearly clear; marked odor.....
" 18	292.0	13.1	0.00	43.542	.....	9.120	2.010	20.48	"
" 25	466.0	30.0	0.00	65.950	.....	11.015	3.400	29.28	Opalescent; strong odor.....
Mar. 4	416.4	54.9	0.00	56.720	.....	9.400	2.440	24.08	Opalescent; slight odor.....
Mean..	408.6	24.6	0.00	56.083	.....	8.149	2.489	22.82	

The mean values for the summer tests as compared with those obtained for Bridgeport show a moderate loss of organic matter but much less than in 1886. This can, doubtless, be explained in two ways. Because of the lower temperature the change was less rapid, and I believe it also true that at Bridgeport the water was not yet in a condition to yield its maximum of decomposition products. Consequently changes took place in the level between Bridgeport and Lockport, which in the former season took place in the Chicago river.

It will be observed that very much less sediment is found at Lockport than at Bridgeport during this period, and it may be urged that most of the improvement can be traced to this, but on several dates the sediment at Lockport was high while at the same time no corresponding increase of albuminoid ammonia or oxygen consumption is apparent.

The winter tests are instructive in this connection. The amount of suspended matter is small while a marked increase in albuminoid ammonia and oxygen consumption can be seen, as compared with the summer condition. Compared with Bridgeport the winter tests show but little improvement. Indeed, there is at times an apparent increase in organic matter.

The theory of retarded rate of oxidation by colder weather affords the best explanation of these peculiarities.

#### JOLIET.

At Joliet two series of tests were made. The samples for the first test were taken at Lock 5, those for the second below dam No. 2. Some distance above the point where the first samples were taken the canal unites with the Desplaines river, but so little water came down the stream during most of the season that its diluting effect may be left out of consideration.

The analyses of the Joliet samples are given in tables IV. and V.

In the four miles between Lockport and dam No. 2, the reduction is quite apparent. It must also be remembered that the sewage of the state prison enters above this point, and practically in an unchanged condition as it flows through a closed sewer. The nature of this sewage is such as to largely increase, at times, the chlorides, as it contains salt and other chlorine compounds produced by processes in operation in the pri on shops.

These compounds undoubtedly assist in retarding oxidation in the sewage which they accompany, so that it is discharged in a comparatively fresh condition into the canal.

A part of the drainage from Joliet itself enters the canal above the point where the samples were taken.

TABLE IV.—JOLIET (UPPER.)

Date. 1888.		Total solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
*May	3	589.5	97.0	0.00	59.47	276.0	15.870	4.250	30.00	Turbid; strong odor.....
"	10	504.8	158.0	0.00	51.89	253.0	8.560	1.810	25.70	Light turbidity; odor plain.....
"	17	587.5	48.5	0.00	19.03	261.0	3.987	1.137	13.92	Light brown; odor distinct.....
"	24	422.2	66.9	0.00	36.86	258.0	3.470	.940	14.24	Light colored sediment; odor bad.....
"	31	433.0	82.5	0.00	57.00	262.8	8.320	.930	13.76	Turbid.....
June	7	403.5	70.7	0.00	24.78	239.0	4.970	.910	13.92	Slightly turbid; yellowish; strong odor.....
"	14	374.0	86.8	0.00	28.32	216.0	6.400	1.790	.....	Slightly turbid; yellowish; strong odor.....
"	21	419.8	142.0	0.00	35.40	234.0	8.040	1.540	14.08	Light colored sediment; strong odor.....
Mean..		441.7	94.0	0.00	39.09	249.9	7.452	1.667	15.70	

TABLE V.—JOLIET (DAM 2.)

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
*May 3	594.0	156.0	0.00	60.200	263.3	14.480	3.300	25.200	Turbid; odor strong.....
" 10	559.5	121.0	0.00	48.140	252.0	7.900	2.000	23.040	Light colored sediment; odor plain
" 17	414.0	46.5	0.00	23.010	276.0	3.925	.887	14.640	" " " "
" 24	441.0	56.4	0.00	28.320	252.0	3.530	.920	11.680	Light; turbid; odor bad.....
" 31	447.4	84.5	0.00	55.990	280.0	8.300	.985	12.520	Turbid.....
June 7	413.6	61.1	0.00	25.381	240.0	6.300	.950	13.280	Slightly turbid; yellowish; strong odor.....
" 14	395.4	96.9	0.00	27.720	218.0	6.600	1.480	13.120	Slightly turbid; yellowish; strong odor.....
" 21	436.3	159.4	0.00	34.970	220.0	7.360	1.020	12.800	Light sediment, strong odor....
" 28	385.2	131.2	0.00	48.334	208.0	8.960	1.470	15.440	Very turbid; odor strong.....
July 5	395.5	87.6	0.00	39.710	212.0	9.100	2.100	12.880	Brownish; slightly turbid; odor perceptible.....
" 12	569.9	172.0	0.00	91.234	246.0	20.800	2.080	18.240	Turbid; strong odor.....
" 19	456.4	103.7	0.00	58.056	246.0	12.720	1.540	14.000	" " " "
" 26	381.2	82.8	0.00	12.733	198.0	8.830	1.030	13.600	" " " "
Aug. 2	842.0	505.2	0.00	63.720	218.0	13.720	3.000	21.200	Very turbid; bad odor.....
" 9	404.2	85.0	0.00	46.253	226.0	6.240	1.860	9.760	Light colored sediment; odor perceptible.....
" 16	345.5	56.3	0.00	33.630	192.0	6.200	.920	11.680	Slight turbidity; odor plain.....
" 23	331.5	126.5	0.00	36.816	168.0	5.740	1.520	13.596	Light colored sediment; bad odor
" 30	376.2	52.8	0.00	41.100	198.0	3.100	1.388	11.840	Opalescent; strong odor.....
Sept. 6	355.0	43.5	0.00	38.940	176.0	10.820	2.060	13.920	" " " "
" 13	370.4	53.5	0.00	38.586	185.0	10.004	1.460	10.000	" " " "
" 15	382.0	56.9	0.00	51.684	179.0	7.360	1.900	6.840	Slight turbidity; bad odor.....
" 20	562.0	96.0	0.00	35.400	220.0	14.280	2.080	11.520	Dark sediment; bad odor.....
" 27	327.0	63.6	0.00	40.700	170.0	6.080	1.880	13.280	Opalescent; strong odor.....
Oct. 5	374.4	84.1	0.00	36.728	180.0	10.010	2.660	17.440	Slightly turbid; not much odor..
" 11	515.2	136.1	0.00	63.720	185.9	9.760	2.040	19.040	Turbid.....
" 25	438.0	87.9	0.00	54.056	230.0	10.120	1.200	11.280	" " " "
Mean. 1889.	442.7	107.9	0.00	43.658	216.8	8.932	1.681	14.301	" " " "
Jan. 14	436.2	37.0	0.00	60.181	.....	7.840	2.680	24.600	Opalescent; strong odor.....
" 21	516.0	100.0	0.00	53.454	.....	7.980	2.480	19.440	" " " "
" 28	500.2	46.5	0.00	65.898	.....	8.186	3.08	19.680	" " " "
Feb. 4	426.4	35.9	0.00	67.260	.....	9.920	2.600	18.32	" " " "
" 11	397.0	36.8	0.00	60.180	.....	9.900	2.28	23.20	" " " "
" 18	436.0	43.5	0.00	85.688	.....	11.300	3.900	23.76	" " " "
Mar. 4	390.0	95.4	0.00	35.450	.....	6.000	2.20	25.216	Less odor than usual.....
" 11	361.0	49.2	0.00	33.630	.....	6.780	2.11	19.52	" " " "
Mean..	432.8	55.5	0.00	57.717	.....	8.488	2.666	21.717	" " " "

Comparing the summer and winter tests of the above tables it is apparent that the indications for organic matter are much stronger during the cold season.

\* Table of mean temperature and precipitation at Joliet for May, June, July, August, September, October, A. D., 1888, with dates of days on which rain fell.—Miss Anna Nash, Observer.

Months.	Temperature Deg. Fahr.	Rainfall— Inches.	Dates on which it rained.
May.....	56.	8.50	3, 7, 8, 11, 16, 23, 24, 26, 27, 28, 30, 31.....
June.....	68.7	1.70	17, 23, 28.....
July.....	72.4	.70	8, 9.....
August.....	65.5	6.00	1, 3, 15, 31.....
September.....	58.	.90	16, 17.....
October.....	43.3	3.30	5, 15, 18.....
Total.....	.....	21.10	.....

The difference in the determinations at Lockport, on May 3d and Joliet is owing to the fact that the samples at Lockport were collected in the morning, but those at Joliet in the afternoon; during this interval there was a very heavy rainfall.—J. H. R.

Unfortunately there are many irregularities in the summer analyses which render the drawing of satisfactory conclusions very difficult. Heavy rainfalls during May and June diluted the water so as to apparently decrease the chlorides, free and albuminoid ammonia. The addition of Joliet drainage and manufacturing waste likewise complicates our problem, because the amount so added is not well enough known to be brought into calculation.

The increase in suspended matter over the amount found at Lockport needs some explanation here. The samples reported in Table V, were taken below the dam, where a great deal of sediment was brought into circulation by the force of the falling water. Most of this matter is apparently of mineral origin and heavy, as it settles soon. The indications of the last column frequently contradict the numbers given in the record, as a light degree of turbidity may be occasioned by a comparatively heavy sediment, and *vice versa*. The waters called opalescent hold very finely divided matter in suspension.

Taking all these points into consideration, it is plain that during the summer there was a moderate degree of oxidation between Lockport and the Joliet dam, and that during the winter the improvement by oxidation was practically zero. In fact, the albuminoid ammonia tests show, apparently, an increase during the winter at the lower point. I shall refer to this below.

### THE ILLINOIS RIVER AND ITS TRIBUTARIES.

Between Joliet and Morris, where the first Illinois river sample was taken, the water of the canal mixes with that of the Kankakee and DuPage. Samples taken from the Kankakee at Wilmington, and from the DuPage, near Channahon, show the general character of these waters. Many of the samples received from Channahon were taken too near the mouth of the river, and were contaminated with canal water. Those sent after August 3d were taken half a mile up stream, and show its true condition. The analyses are given in Table VI.

TABLE VI.—CHANNAHON (DuPage River.)

Date.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....	Physical Conditions.
May 4	347.5	26.0	.156	31.150	252.0	4.700	.925	8.000	Slightly colored; clear; odorless.
" 11	353.0	24.0	.882	8.250	249.0	.689	.395	7.440	Nearly colorless; odorless.....
" 18	322.9	16.0	.315	11.920	250.2	1.271	.394	7.600	Colorless; slight earthy odor....
" 25	372.8	62.3	.441	8.500	276.0	.306	.614	8.640	Yellowish; earthy odor.....
June 1	322.5	31.7	1.764	7.788	240.0	.534	.426	9.680	Nearly clear; bad odor.....
" 8	321.2	18.5	.867	7.080	230.0	.405	.459	6.560	Slightly turbid; yellowish; earthy odor.....
" 15	345.8	13.7	.252	19.116	206.0	1.596	.402	8.480	Slightly turbid; yellowish; earthy odor.....
" 22	318.8	18.6	trace	34.196	226.0	4.230	.600	6.480	Nearly clear; yellowish; earthy odor.....
" 29	305.0	23.9	.693	37.520	222.0	4.870	.600	6.080	Nearly clear; yellowish; earthy odor.....
July 6	418.4	11.7	.315	56.640	216.0	9.580	.605	5.160	Nearly clear; yellowish; earthy odor.....
" 13	317.0	17.3	1.260	9.204	236.0	.670	.360	5.200	Slightly opalescent; earthy odor.....
" 20	354.9	11.0	trace	45.782	218.0	7.180	.770	7.120	Clear, yellow; odorless.....
" 27	389.0	10.5	.240	46.720	218.0	5.020	.465	7.360	Nearly clear; earthy odor.....
Aug. 3	304.9	7.2	trace	45.428	184.0	7.520	.540	4.900	Opalescent yellow; earthy odor.....
" 10	306.5	13.5	trace	8.142	260.0	.920	.520	4.320	Opalescent; colorless; earthy odor.....
" 17	281.2	17.8	.756	1.532	220.0	.400	.360	5.360	Opalescent; yellow; earthy odor.....
" 24	250.1	14.1	trace	5.664	220.0	.370	.330	3.800	Slight opalescence; colorless; earthy odor.....
" 31	284.1	11.6	.200	6.726	250.0	.780	.420	5.120	Slight opalescence; colorless; earthy odor.....
Sept. 7	308.0	12.2	1.197	5.426	254.0	.142	.234	5.200	Slight opalescence; colorless; earthy odor.....
" 14	308.0	14.5	trace	6.761	240.0	.134	.290	4.400	Slight opalescence; colorless; earthy odor.....
" 21	325.0	15.5	.....	6.250	270.0	.176	.266	4.000	Clear; odorless.....
*Mean.	294.7	14.1	.307	5.786	244.8	.417	.346	4.743	

\* Mean for last 7.

TABLE VII.—WILMINGTON (Kankakee River.)\*

Date.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardne s CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....	Physical Conditions.
May	4	230.3	11.0	.060	1.180	165.6	.125	.660	11.600	Greenish color; clear; odorless..
"	11	244.5	15.0	.151	1.270	172.2	.103	.620	14.400	Yellowish, clear; odorless.....
"	18	269.0	16.0	.060	1.530	213.6	.076	.590	14.880	
"	25	246.6	12.2	.....	1.160	196.8	.044	.460	13.049	Slightly colored; earthy odor...
June	1	422.2	274.0	1.323	1.180	141.6	.100	.784	19.520	Muddy, odorless, nearly clear...
"	8	251.4	20.7	.....	1.065	140.0	.093	.580	15.200	Yellowish; earthy odor; nearly clear
"	15	253.0	16.2	trace	.708	.....	.077	.710	12.320	Yellowish, earthy odor, slightly turbid.
"	22	271.4	19.2	.....	1.770	218.0	.088	.702	15.480	Yellowish, odorless.....
July	6	211.7	29.5	trace	1.062	146.0	.090	.448	11.120	Opalescent, yellowish, earthy odor.....
"	13	223.2	42.3	.189	2.584	138.0	.087	.480	14.329	Yellowish, odorless, nearly clear.
"	27	212.5	15.4	trace	.354	194.0	.104	.496	14.160	Yellow, earthy odor.....
Aug.	3	226.4	10.2	.....	.708	174.0	.084	.586	13.200	Clear, yellow, earthy odor.....
"	10	205.0	22.0	.....	1.062	160.0	.230	.584	8.480	Slight cloudiness, yellowish earthy odor.....
"	17	206.2	14.0	.....	.354	144.0	.112	.630	13.020	Opalescent, yellow, odorless.....
"	24	216.4	18.5	.....	.354	148.0	.094	.582	9.280	Opalescent, yellow, slight earthy odor.....
"	31	241.3	27.8	.....	.354	182.0	.098	.378	12.000	Opalescent, yellow, slight earthy odor.....
Sept.	7	269.2	32.4	.....	.944	188.0	.086	.730	10.120	Opalescent, yellow, slight earthy odor.....
"	14	304.0	47.7	.....	.460	190.0	.214	.600	10.400	Opalescent, yellowish, odorless..
"	21	273.0	34.2	.....	1.175	206.0	.272	.494	8.000	"
Mean..		251.4	35.6	.094	1.015	164.1	.114	.585	12.661	

The flow during the latter part of the season was very small, however, and its effect in forming the character of the Illinois river must be considered as insignificant. With the Kankakee the case is different. The flow here is considerable, and the character of the water important. From Table VII. it will be seen that the amount of organic matter in this water, as indicated by albuminoid ammonia and oxygen consumption, is quite large, and although it is undoubtedly chiefly of vegetable origin, its effect must not be lost sight of. The Illinois water at Morris is practically made up of Kankakee river water and canal water, and it is important to know how one is modified by the other.

\* Rainfall at Watseka, on one of the tributaries of the Kankakee, taken by Henry Upsall. May, 4.96; June, 4.43; July, 2.49; August, 0.61; September, 0.50; October, 3.36. Total, in inches, 16.35.—J. H. R.

TABLE VIII.—MORRIS.

	Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
May	5	440.5	40.0	.000	32.400	244.8	7.91	.725	12.64	Color dark; odor distinct.....
"	12	407.0	28.5	.000	21.240	241.2	3.54	.706	12.00	Yellowish; earthy odor.....
"	19	386.7	18.5	.....	21.830	255.6	1.924	.764	13.52	Slight color; earthy odor.....
"	26	387.5	29.2	.....	23.010	272.4	.338	.560	8.16	Nearly clear; odor very slight..
June	2	308.0	53.0	2.457	3.540	213.6	.400	.530	10.96	Muddy, earthy odor.....
"	9	364.9	18.7	.....	24.280	220.0	3.450	.602	13.12	Slightly turbid, yellow, earthy odor.....
"	16	359.5	27.4	1.008	27.416	252.0	5.420	.540	9.84	Slightly turbid, yellow, earthy odor.....
"	23	318.5	23.0	trace	25.346	226.0	3.305	.545	12.08	Nearly clear, yellowish, earthy odor.....
"	30	287.9	49.7	.250	7.682	222.0	.995	.642	13.92	Nearly clear, yellowish, earthy odor.....
July	7	287.7	18.5	trace	12.956	174.0	3.036	.554	11.60	Opalescent, yellowish, some odor.
"	14	313.0	38.7	trace	16.496	188.0	2.750	.665	13.12	Opalescent, earthy odor.....
"	21	340.1	36.5	.504	31.622	202.0	4.150	.600	16.90	Nearly clear, yellow, odorless..
"	28	441.6	120.0	.378	14.200	206.0	3.910	.886	13.840	Very turbid, earthy odor.....
Aug.	4	330.5	24.5	.180	39.407	190.0	4.00	.540	9.120	Opalescent, yellow, earthy odor.
Sept.	1	376.0	32.5	.....	33.984	210.0	4.890	1.090	7.680	Colorless, odorless, light float- ing matter.....
"	8	433.0	17.8	4.032	49.206	250.0	8.040	.570	8.000	Clear, yellow, earthy odor.....
"	15	372.4	9.0	.....	48.852	188.0	6.240	.800	6.320	Clear, earthy odor.....
"	17	282.0	3.9	trace	34.691	180.0	3.820	1.050	6.240	.....
"	22	370.0	6.4	.....	47.082	192.0	5.890	1.080	7.200	Clear and odorless.....
"	29	343.0	11.5	trace	56.640	222.0	.928	.670	7.520	Clear, colorless, slight odor.....
Oct.	6	273.4	6.5	trace	38.740	182.0	6.820	.630	5.600	.....
"	13	360.0	22.5	.....	56.990	210.0	12.62	.950	11.760	Clear, slightly yellowish, strong odor.....
"	20	355.8	60.3	.....	54.600	204.0	.841	.088	8.480	Yellow, odorless.....
"	27	408.6	43.8	.....	44.375	210.0	3.460	1.200	22.400	Very dirty, strong odor.....
Mean...		355.9	30.85	.367	32.149	214.8	4.107	.707	10.920	
1889										
Jan.	14	349.5	13.0	0.00	28.320	.....	4.560	1.360	9.100	Nearly clear; earthy odor.....
"	21	346.6	13.5	0.00	21.948	.....	4.040	1.020	7.920	Nearly clear; odorless.....
"	28	416.0	13.9	0.00	23.010	.....	5.680	1.460	8.320	Nearly clear; organic odor.....
Feb.	4	381.0	33.0	0.00	31.650	.....	5.300	1.800	9.100	Nearly clear; earthy odor.....
"	11	390.0	29.3	0.00	33.630	.....	5.710	2.700	10.50	.....
"	18	280.0	52.5	0.00	14.160	.....	2.640	1.200	8.210	Opalescent; slight odor.....
"	25	463.0	69.2	0.00	40.456	.....	7.920	1.520	14.22	Turbid; strong odor.....
Mar.	4	276.0	28.2	0.00	36.816	.....	1.880	1.640	18.20	Opalescent; yellowish; strong odor.....
Mean..		325.2	29.1	0.00	28.748	.....	4.716	1.587	10.696	

Table VIII. gives the results found by analyses of the Morris samples. Comparing the winter with the summer results the increased albuminoid ammonia of the colder weather is very apparent. There is no increase in suspended matter and probably no important change in concentration as the chlorine remains about the same.

During the summer months the decrease in albuminoid ammonia and oxygen consumption between Joliet and Morris indicates an important loss of organic matter. It might appear that this is largely due to sedimentation, as the difference in suspended matter between Joliet and Morris is likewise large. But the high suspended matter at Joliet is largely made up of fine mineral particles, as the water at that point was taken immediately below the dam, where the agitation was great.

The dilution by Kankakee water can not explain much of this reduction because of its own large amount of nitrogenous organic matter. The proportion of Kankakee water at Morris can be approximately estimated by considering that the decrease in chlorides is due to dilution with a water containing much less chlorine. Knowing the amount of chlorine at the three points, Joliet, Wilmington and Morris, and assuming that there is no loss in chlorine on the way, which is practically true, a little calculation will give us the amount of Kankakee water mixed with that from Joliet to furnish the observed average at Morris. In this way I find the dilution to be about 20 per cent.



Supposing now no change to take place in the nitrogenous constituents the mixture of Kankakee and canal water should give a product yielding 1.46 per million of albuminoid ammonia, but we have an average of less than half of that, for the summer.

The oxygen consumption sinks at Morris below that found for the Kankakee, which is another strong evidence of purification.

Probably fifty per cent. of the organic matter present at Joliet is decomposed before Morris is reached. After leaving Morris the river flows without dilution to Ottawa, where the Fox enters. Table IX gives analyses of the water of this stream.

The next regular samples were taken at LaSalle and below the entrance of the Big and Little Vermilion rivers. The flow from both of those streams was comparatively small during most of the time of the examinations.

Tables X, XI and XII contain the results of the analyses of these two waters and of the Illinois.

TABLE IX.—OTTAWA (Fox River.)

Date. 1888.		Total Solids..	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.	Mean temper- ature week ending.....	Total rainfall week ending
May	14	281.0	5.0	.....	3.19	244.2	.079	.365	9.76	Nearly clear; slight earthy odor.....	50.51	.81
"	21	281.8	13.6	.126	2.94	220.8	.116	.450	6.64	Nearly clear; Slight earthy odor.....	50.47	.48
"	28	280.9	28.3	trace	1.77	222.6	.084	.360	6.60	Turbid from rain; earthy odor.....	64.20	2.33
June	5	322.5	50.6	.....	2.90	248.4	.088	.394	8.60	Clear; slight color; odorless.....	58.58	.38
"	11	312.5	18.6	.....	3.540	250.0	.068	.344	6.72	Slightly turbid; yellow- ish; odorless.....	64.02	.00
"	18	333.8	30.1	.....	4.650	288.0	.128	.452	5.28	Nearly clear; yellow- ish; odorless.....	75.61	.47
"	25	368.0	51.0	.060	4.720	280.0	.122	.490	7.60	Nearly clear; yellow- ish; odorless.....	75.41	.25
J ly	2	285.2	20.3	.....	2.94	252.0	.086	.296	5.60	Nearly clear; yellow- ish; odorless.....	66.91	.36
"	9	620.2	400.4	.125	7.496	146.0	.272	1.140	9.28	Muddy.....	74.72	1.54
"	16	320.5	43.1	trace	5.897	253.0	.140	.308	6.08	Opalescent; odorless..	69.36	.00
"	23	314.0	30.3	trace	7.434	254.0	.100	.358	4.72	"	71.45	.20
*Aug.	6	463.2	41.8	.180	.....	.....	3.118	.602	13.760	Nearly clear; yellow; earthy odor.....	75.31	1.11
"	13	335.0	24.6	.....	8.021	236.0	.084	.336	6.000	Opalescent; yellowish; odorless.....	61.24	.22
"	20	279.2	22.0	trace	4.248	244.0	.226	.910	6.640	Opalescent; yellowish; earthy odor.....	71.75	1.72
"	27	287.8	8.8	.....	4.176	240.	.066	.278	5.120	Nearly clear; slight earthy odor.....	66.67	.00
Sept.	3	284.2	8.0	.....	7.667	250.	.054	.420	7.520	Nearly clear; slight earthy odor.....	65.45	.01
"	10	290.5	25.4	.....	5.189	248.	.088	.440	6.400	Floating matter; yellow- ish; earthy odor.....	62.69	.29
"	17	286.0	12.5	.....	7.788	240.	.095	.400	4.880	Clear; odorless .....	57.37	1.07
Mean	.	330.3	46.3	.027	4.974	242.1	.278	.463	7.066			

\* Not enough water sent.

† These observations are the means of the records from Aurora and Oswego—the nearest available places. Dr. M. M. Robbins, Observer, Aurora; John Seely, Observer, Oswego.—J. H. R.

TABLE X.—LASALLE (Big Vermilion.)

Date. 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.	*Mean temper- ature week ending.....	*Total rainfall week ending.
May	7	618.0	258.5	1.323	6.48	242.4	.180	.693	9.04	Turbid; no odor; yellowish.....	41.76	1.46
"	14	457.5	101.0	2.140	2.58	213.6	.142	.270	8.40	Slight earthy odor; yellowish.....	39.11	.22
"	21	378.5	25.3	4.347	4.70	244.8	.002	.194	3.36	Slightly turbid; odorless.....	.....	1.00
"	28	456.9	101.5	4.914	4.106	260.	.073	.340	6.64	Nearly clear; odorless.	.....	3.02
June	11	429.5	22.3	3.970	6.440	290.	.015	.182	7.20	Colorless; odorless; floating organic matter.....	53.89	.00
"	18	436.2	60.0	2.898	9.204	278.	.418	.440	5.60	Nearly clear; yellowish; odorless.....	63.40	1.58
July	16	377.5	46.2	3.843	4.718	262.	.077	.270	8.160	Opalescent; earthy odor.....	61.14	.15
Mean		450.6	87.8	3.348	5.461	255.8	.129	.341	6.914			

TABLE XI.—LASALLE (Little Vermilion.)

May	7	446.0	37.5	.207	6.44	112.8	.348	.358	5.44	Light yellow; earthy color; floating organic matter.....	.....	.....
"	14	346.0	10.0	.252	4.71	177.0	.079	.250	5.08	Odorless; colorless.....	.....	.....
"	21	420.3	48.4	.125	4.25	132.	.038	.436	4.96	Light brown; earthy odor.....	.....	.....
"	28	468.5	44.5	1.700	4.460	308.	.062	.278	10.40	Nearly clear; colorless; odorless.....	.....	.....
June	11	314.7	13.7	.126	6.478	238.	.342	.434	7.60	Colorless; floating organic matter.....	.....	.....
"	18	325.0	25.3	.....	5.876	250.	.082	.674	7.76	Nearly clear; yellowish; odorless.....	.....	.....
July	16	305.5	36.2	.125	7.434	254.	.312	.450	8.80	Slightly turbid; yellow; earthy odor.....	.....	.....
Mean		375.1	30.8	.362	5.664	210.2	.180	.411	7.15			

TABLE XII.—LASALLE (Illinois River.)

May	7	327.5	26.2	.228	13.31	192.0	.638	.500	11.36	Yellowish; odorless....	452.14	4.55
"	14	395.5	45.3	1.070	13.81	219.0	1.080	.608	11.04	Brownish;.....	53.32	1.03
"	21	314.9	11.5	.630	8.85	228.0	.216	.402	4.40	Yellowish; earthy odor	52.57	.56
"	28	318.5	43.0	1.638	5.664	204.0	.076	.492	12.64	Nearly clear; odorless.	64.89	3.25
June	11	318.9	15.5	1.320	9.204	210.0	.176	.480	11.36	" " "	65.43	.10
"	18	333.0	34.2	.630	12.954	242.0	.201	.546	10.64	" " "	73.94	.94
"	25	327.9	55.5	.567	10.620	256.0	.118	.446	10.00	Slightly turbid; yellowish; odorless.....	73.78	.77
July	2	527.7	326.5	.504	3.640	112.0	.104	.540	6.00	Very turbid; earthy odor	67.40	.07
"	9	364.0	152.2	.880	7.650	136.0	.238	.700	9.840	Turbid; yellowish; odorless.....	73.70	2.54
"	16	301.7	68.3	.900	9.583	166.0	.049	.490	12.04	Turbid; earthy odor...	71.33	.06
"	23	293.3	19.8	.124	11.915	160.0	.086	.562	9.760	Yellowish; nearly clear; earthy odor.....	71.33	.00
"	30	291.0	25.5	.819	13.685	186.0	.144	.406	10.080	Yellow; earthy odor; slightly turbid.....	74.60	.98
Aug.	6	291.0	29.4	.315	24.780	190.0	1.014	.550	9.280	Opalescent; yellowish; earthy odor.....	75.10	.71
"	29	325.2	57.9	1.386	18.471	200.	.072	.474	9.200	Nearly clear; earthy odor.....	66.42	.00
Sept.	3	307.9	26.4	.550	21.240	220.	.100	.848	8.400	Nearly clear; earthy odor; yellowish.....	62.80	.00
"	17	363.0	33.0	3.276	26.550	225.	.128	.560	5.440	Slightly turbid; earthy odor.....	56.68	.19
"	20	327.2	20.8	2.646	32.684	228.	.474	.464	9.360	Yellowish; nearly clear; earthy odor.....	.....	.....
"	24	351.4	25.2	1.890	27.728	239.	.125	.540	5.040	Nearly clear; earthy odor.....	57.68	.16

\*These observations are furnished by Mr. Isaac Young, Observer, Pontiac—the nearest available point.—J. H. R.

†These data furnished by Dr. J. O. Harris, Observer, Ottawa.

TABLE XII.—Continued.

Date. 1888.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine .....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.	Mean temper- ature — week ending.....	Total rainfall week ending.
Oct.	1	380.0	29.8	1.764	44.604	256.	4.320	.930	7.120	Nearly clear; odorless; slightly yellow.....	51.60	.00
"	8	377.0	18.0	.760	39.294	240.	1.584	.450	6.720	Opalescent; odorless...	44.78	.53
"	15	370.0	45.9	1.960	28.670	230.	.892	.474	6.40	Nearly clear; earthy odor.....	47.21	.09
"	22	349.4	10.4	trace	35.672	260.	1.336	.340	4.80	Nearly clear; odorless.	41.18	1.67
"	29	395.8	35.9	.....	32.922	250.	1.156	.312	5.92		45.92	.42
Mean.		345.7	50.3	1.037	19.717	211.7	.623	.526	8.558			
1889.												
Jan.	14	349.	14.	1.660	14.974	.....	1.187	.485	5.360	Nearly clear; odorless.	25.64	1.30
"	21	310.	21.	trace	14.500	.....	.535	.430	5.120	Nearly clear; slight odor	23.50	.61
"	28	449.4	92.	2.709	11.428	.....	.926	.372	5.360	Turbid; earthy odor...	27.03	.00
Feb.	4	350.	30.	1.638	9.676	.....	1.600	.452	.....	Nearly clear; odorless.	27.21	.00
"	11	338.	4.2	trace	18.054	.....	1.815	.560	7.500	Clear; earthy odor;	19.00	.11
"	18	379.	61.5	"	20.296	.....	2.456	.821	9.800	slightly turbid.....	21.64	.87
"	25	357.	9.0	1.270	15.300	.....	2.808	.675	8.500	Yellow; earthy odor...	7.50	.00
Mar.	4	758.	534.2	0.000	7.70	.....	.712	1.420	24.000	Muddy; odorless.....	32.25	.65
"	11	468.	78.5	1.200	6.018	.....	1.077	.520	11.600	Turbid; earthy odor...	33.85	.07
Mean..		417.6	93.8	.942	13.105	.....	1.456	.637	8.582			

It will be noticed that the results given in the above tables are very irregular. This is especially true of the data for the Big Vermilion river, and the Illinois during the early part of the season. It must be remembered that the rainfall at that time was heavy, producing abnormal conditions.

Comparing the winter and summer results as obtained at LaSalle, it would appear at first sight that the colder season shows a decrease instead of an increase of organic contamination, as indicated by albuminoid ammonia.

However, if we notice the chlorine found during the two periods, it is apparent that the dilution between Morris and LaSalle is far greater during the winter than during the summer. If we leave out of consideration the earlier summer tests and late winter tests, when the stream was abnormally diluted by heavy rains and melting snow, we find that the chlorine amounts to nearly twice as much during the summer as during the winter, which points to a correspondingly lower dilution by the Fox, Big Vermilion and Little Vermilion.

It is evident that the actual winter change has been less than the summer change here, as at Morris.

To estimate the amount of oxidation between Morris and LaSalle is not an easy matter. Considering especially the summer work, we notice with an increase of sediment a very decided reduction in the amount of free ammonia, but the changes as shown by the albuminoid ammonia and oxygen consumption are not as readily seen. The chlorine between Morris and LaSalle is reduced from 32 parts per 1,000,000 to about 20 parts, and by means of water containing about 6 parts per 1,000,000. This indicates a considerable dilution, but it must be remembered that the diluting water gives nearly as strong tests for organic matter as does the main stream. This organic matter

is mostly of vegetable origin and undoubtedly of a more stable type than that of sewage origin. The Kankakee adds about as much per 1,000,000 to the Illinois above Morris as there is present at LaSalle, and after the addition of fresh matter by the Fox and in some degree by the sewage of Ottawa, and finally by the Big and Little Vermilion rivers it is plain that we have no means of showing how much impurity indicated by the tests at LaSalle left the pumps at Bridgeport and how much was added by the tributaries.

The appearance of nitrates and nitrites in these waters is worthy of notice. The canal water at Bridgeport and Joliet seems to show only occasional traces of these products of oxidation, but at Morris they appear more regularly and are uniformly found below in the main stream. In most of the tributaries they are less abundant being practically absent from the Kankakee and Fox. The Big Vermilion, however, receiving a part of the drainage of Streator, contains more than the usual proportion.

It seems reasonably well established that these compounds, which are products of bacterial fermentation of ammoniacal salts are practically never found in fresh sewage. A certain time is required for their development and also the presence of an abundance of free oxygen. It is also reasonably well established that other easily fermentable bodies must not be present, as in such cases denitrification takes place with destruction of nitrates and evolution of free nitrogen even. Supposing a certain amount of nitrification to have taken place between Bridgeport and Lockport, it follows from numerous experiments that the oxygen of the nitrates so formed must be immediately given up to aid in other more fundamental processes, and consequently while free ammonia disappears the tests reveal no nitrates or nitrites. Observations bearing on similar phenomena have been made by Munro, Warrington, Leone and others within the past few years.

In the Illinois river the bodies which lead to the destruction of nitrates or prevent their formation seem to disappear between Joliet and Morris, and it is interesting to note that the uniform appearance of nitrates is coincident with the slower disappearance of albuminoid ammonia in the river below Morris.

I believe this formation of nitrates can be taken as the indication of the completion of one of the important stages in the destruction of animal organic matters in water, that is, where the original contaminating substances have been broken up by ferment action, and derived products of less complexity but greater stability have taken their place. These products may be similar to leucine and tyrosine or other nitrogenous body referred to some distance back. The bacteria of denitrification can no longer live in such water.

Between LaSalle and Henry we have a stretch of 28 miles without dilution, except by rain. During the summer the consumption of oxygen is rather greater at the second place than at the first, but there is a decided reduction in free and albuminoid ammonia. It appears probable, therefore, that some destruction of organic matter goes on in this portion of the river.

The analyses are given in table XIII. The increased chlorides and free ammonia on Oct. 9th and 12th at Henry and on Oct. 1st and 8th at LaSalle are undoubtedly due to the diminished flow but stronger concentration of canal water pumped from Sept. 13th to 19th, when only half the pumps were in operation.

TABLE XIII.—HENRY (Illinois River).

Date. 1888.		Total Solids..	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.	*Mean temper- ature week ending .....	†Total rainfall week ending..
May	10	285.5	13.0	.258	12.49	208.8	.568	.470	10.40	Yellowish; odorless ...	56.2	1.44
"	17	307.1	11.0	.472	11.32	234.0	.727	.510	9.60	Yellow; earthy odor ...	...	.30
"	24	299.7	23.9	.346	7.08	250.0	.146	.372	9.44	" " " " " " " "	...	.73
June	1	245.	16.7	.504	3.540	176.4	.204	.478	8.640	Nearly clear; odorless.	68.9	3.80
"	7	257.	10.8	1.260	4.708	154.0	.025	.349	10.00	" " " " " " " "	...	.00
"	14	264.1	19.5	.....	4.268	152.0	.418	.766	10.16	Earthy odor; yellowish; nearly clear .....	...	...
July	12	402.2	138.2	.250	5.876	152.	.190	.566	12.340	Very turbid; earthy odor	74.7	.55
"	19	277.0	30.4	1.260	7.788	166.	.117	.450	11.760	Cloudy; earthy odor...	...	.00
"	26	267.5	24.8	.420	30.677	186.	.196	.43	13.040	Slightly turbid; yellow- ish; earthy odor.....	...	.30
Aug.	4	332.0	32.0	.660	11.788	186.	.182	.514	9.600	Opalescent; yellowish; odor earthy .....	71.0	2.15
"	9	282.0	20.2	1.134	15.346	200.	.360	.550	7.360	Opalescent; yellowish; odorless.....	...	.20
"	28	258.9	20.6	1.135	16.860	190.	.212	.474	8.320	Opalescent; yellowish; odorless.....	...	.25
Sept.	14	326.8	24.5	1.008	21.240	198.	.332	.526	6.800	Nearly clear; odorless..	60.3	.70
"	21	323.8	23.3	1.250	17.445	222.	.368	.440	6.320	" " " " " " " "	...	.50
"	27	326.4	30.2	1.260	28.143	218.	.336	.476	6.320	" " " " " " " "	...	.01
Oct.	9	355.4	15.0	trace	28.702	264.	1.606	.860	7.680	Slightly opalescent; odorless.....	47.3	.30
"	12	355.4	39.0	1.764	38.230	228.0	1.526	.428	5.680	Nearly clear; odorless.	...	.00
"	22	314.4	15.7	trace	28.392	264.0	.416	.204	5.280	" " " " " " " "	...	1.91
"	29	333.8	14.0	"	31.860	235.0	.952	.280	5.760	" " " " " " " "	...	.50
Mean..		306.	27.5	.683	17.660	204.4	.467	.481	8.657			
1889.												
Jan.	14	325.	14.	trace	12.390	.....	.985	.300	6.300	Clear; odorless .....	...	1.01
"	21	303.	19.5	1.670	10.976	.....	1.356	.321	5.840	" " " " " " " "	...	.54
"	28	336.	20.0	1.250	8.496	.....	.707	.254	5.840	" " " " " " " "	...	.00
Feb.	25	264.	9.5	1.890	18.808	.....	1.320	.714	12.40	" " " " " " " "	...	.00
Mar.	4	354.	91.5	trace	7.788	.....	.926	.430	12.80	Turbid; slight odor ....	...	.10
Mean .		316.	30.9	.962	11.691	.....	1.059	.404	8.636			

Comparing the winter and summer tests we have in the colder season a decrease in suspended matter, decrease in chlorides, marked increase in free ammonia, and apparent decrease in albuminoid ammonia. Taking into consideration the greater dilution as indicated by the lower chlorides, it is probable that the albuminoid ammonia here is greater in winter than in summer, in proportion to the amount of Bridgeport water present.

Two sets of determinations were made at Peoria, 35 miles below Henry. In one case the water was taken from a hydrant in the city and in the other from the river—Lake Peoria—near the end of the inlet pipe. A single analysis was made of water taken at the "Narrows," some distance above. During the winter the samples were taken at the upper bridge, about a mile and a half above the inlet, and at a point removed from danger of local contamination.

\* Data furnished by A. T. Purviance, Observer, Hennepin.—J. H. R.

TABLE XIV.—PEORIA (Inlet.)

Date. 1888.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Condit ons.	*Mean temper- ature week ending.....	*Total rainfall week ending.
May	9	277.0	14.5	.220	9.910	189.5	.172	.625	17.100	Yellowish; odorless....	60.28	1.69
"	14	434.5	38.5	.063	15.220	212.4	.168	.595	9.560	Nearly clear; odorless.	57.20	.05
"	21	316.4	7.7	.535	10.370	215.0	.436	.372	8.240	"	59.75	.36
"	28	297.5	24.0	.693	7.667	204.4	.068	.412	6.920	Turbid; odorless.....	70.47	4.49
June	4	263.4	15.7	.625	5.664	180.0	.199	.423	9.600	Nearly clear; earthy odor.....	64.97	.14
"	11	1000.0	641.9	1.764	10.835	185.0	.162	.596	14.400	Very turbid; strong earthy odor.....	74.80	.08
"	25	282.9	11.8	.252	8.258	240.0	.220	.480	9.520	Clear; yellowish; odor- less.....	77.66	.68
July	2	279.5	21.3	.378	8.021	208.0	.328	.816	10.800	Clear; yellowish; odor- less.....	75.67	.67
"	9	295.9	76.4	.221	19.470	186.0	.148	.446	8.720	Slightly turbid; earthy odor.....	81.38	4.70
"	16	210.5	11.2	2.830	5.543	154.0	.056	.468	9.760	Slightly yellow; near- ly clear; earthy odor.	75.21	.45
"	23	289.0	10.6	.260	7.080	190.0	.087	.562	9.120	Clear; yellowish; slight earthy odor.....	77.13	.09
"	27	309.5	46.5	.360	7.450	182.0	.234	.500	10.240	Opalescent; odorless ..	81.07	1.24
"	31	265.5	17.5	.210	8.637	182.0	.468	.846	13.280	Nearly clear; yellow- ish; odorless.....	85.07	.00
Aug.	7	244.3	8.8	.220	11.444	196.0	.113	.422	8.960	Clear; yellow; earthy odor.....	81.03	.35
"	13	298.5	11.2	1.008	13.568	216.0	.140	.620	11.600	Clear; yellow; earthy odor.....	58.60	.60
Sept	17	284.2	14.8	2.520	17.700	186.0	.224	.480	8.000	Nearly clear; odorless.	60.83	1.07
"	24	299.6	23.7	1.260	19.470	216.0	.210	.504	7.200	"	64.11	3.63
Oct.	1	320.0	19.2	3.520	24.072	230.0	.287	.426	6.880	"	54.11	.00
"	8	297.2	16.0	Trace	24.426	222.0	.284	.332	5.720	"	52.03	.38
Mean..		329.75	54.27	.8915	12.358	199.7	.210	.522	9.769			

## FROM THE NARROWS.

Aug.	10	276.4	16.6	.230	12.390	200.	.166	.408	8.480	Opalescent; yellow- ish; odorless.....	73.25	.53
------	----	-------	------	------	--------	------	------	------	-------	---	-------	-----

## UPPER BRIDGE.

1889.												
Feb.	14	331.0	4.0	1.885	14.511	.....	1.157	.510	7.20	Clear; odorless .....	28.35	.13
"	21	344.0	5.5	1.175	14.868	.....	1.398	.465	7.20	Clear; earthy odor.....	26.34	.43
"	25	346.0	11.6	trace	14.920	.....	2.444	.645	8.20	"	.....	.....
"	28	336.0	29.0		15.576	.....	2.430	.552	11.00	Nearly clear; yellow- ish; slight odor .....	21.07	.26
Mar.	4	236.0	15.0	"	7.434	.....	1.075	.555	9.60	Clear; earthy odor .....	.....	.....
"	7	336.0	96.4	"	9.735	.....	1.322	.570	14.47	Slightly turbid; od'less	38.85	.57
Mean..		331.0	26.9	.510	12.860	.....	1.637	.549	9.611			

\* Observer, Dr. F. Brendel, Peoria.

TABLE XV.—PEORIA (Hydrant.)

Date. 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
May	21	356.9	19.5	1.130	27.61	214.8	.076	.330	8.00	Nearly colorless; odorless.....
	28	457.9	132.0	.945	23.567	224.4	.066	.440	8.88	Turbid with slight earthy odor..
June	5	319.8	25.5	1.320	14.726	187.2	.031	.350	8.20	Turbid; yellowish; odorless.....
July	3	330.4	15.6	.567	24.780	243.0	.082	.482	8.96	Clear; yellowish; odorless.....
	10	281.0	37.0	1.658	21.240	180.0	.034	.420	8.32	Slightly turbid; odorless.....
"	17	292.4	18.0	1.008	19.586	198.0	.108	.398	10.16	.....
"	24	265.7	24.0	.315	19.232	178.0	.033	.490	11.18	Nearly clear; yellowish; earthy odor.....
Aug.	1	296.6	21.0	.630	20.765	186.0	.131	.664	10.80	Nearly clear; yellowish; odorless
	8	301.0	8.0	2.394	27.728	218.0	.133	.376	5.72	Clear; yellowish; slight earthy odor.....
"	14	325.0	11.0	2.079	31.976	198.0	.092	.376	8.88	Opalescent; yellowish; earthy odor.....
Sept.	18	323.0	12.4	.520	35.400	208.0	.071	.396	6.56	Nearly clear; odorless.....
	25	333.2	22.2	trace	43.658	194.0	.060	.410	7.20	Nearly clear; slight odor.....
Oct.	2	347.8	17.1	trace	43.240	224.0	.208	.384	6.00	Opalescent; odorless.....
	9	348.0	15.2	trace	43.188	240.0	.098	.340	7.125	Clear and odorless.....
Mean		327.7	27.4	.897	28.334	206.6	.087	.397	8.184	

The results are given in Tables XIV and XV. These show considerable differences between the inlet and hydrant water and not always in favor of the latter. The excess of chlorides in the hydrant water is especially noteworthy, which suggests a contamination with salt from some source. It is said that there is a break in the pipe near the shore and at a point where contaminated water could be drawn. Part of the overflow from an artesian well enters the river near where the break is supposed to exist, and besides this a ditch, which serves as a drain for a part of the city, discharges its contents at the same point.

As regards organic matter, as indicated by consumption of oxygen and albuminoid ammonia found, the Peoria tests seem to show a worse instead of a better condition of affairs than at Henry. There is an increase in suspended matter and nitrates, but a marked decrease in chlorides. This latter must be largely attributed to dilution and it gives us roughly a measure of its amount. The weather-bureau observations show an excessive rainfall at Peoria, sufficient, I think, to account for this dilution.

Taking this into consideration it is plain that the water of Peoria Lake must be contaminated to no small extent. The samples were taken, as mentioned above, near the outer end of the inlet pipe which supplies the city. This was supposed to be beyond danger of contamination by local causes, but a personal inspection in November convinced me that this is far from being the case. A portion of the city sewage flows into the lake and in addition to this, the drainage from the large glucose factories and distilleries. A portion of this drainage is *clean*, consisting of the slops from the grain. It is, however, largely nitrogenous and soon begins to putrefy thus becoming an active source of contamination. In some of the large distilleries, during the period under examination, this slop was not discharged into the lake but was fed to cattle. I am informed that 15,000 head were fed there during the summer, and that 2,500,000 bushels of grain was mashed. This number of cattle was increased to 26,000 during the colder months.

As the drainage from all the cattle sheds passes immediately into the lake, the explanation of its contamination is not difficult. With the wind from the south a portion of this filth drifts even beyond the point where the water supply is taken.

The effect of this contamination is shown in a marked degree at Pekin, 10 miles below. With an increase in albuminoid ammonia we have a three-fold increase in free ammonia, both reaching 1 part per 1,000,000 on several occasions during the summer, as shown in Table XVI. During the winter the excess of albuminoid ammonia over that found at the upper bridge is quite marked.

TABLE XVI.—PEKIN (River.)

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.	*Mean temper- ature.....	*Total rainfall Week ending.....
May 21	329.7	21.3	.882	11.560	218.4	.486	.502	6.560	Nearly clear; odorless.	55.00	.29
28	1010.9	704.3	.567	7.434	219.6	.221	.922	22.400	Very turbid; odorless.	68.85	5.75
June 4	328.0	79.5	.819	4.325	162.0	.296	.465	7.560	Turbid; odorless.....	63.85	.13
11	302.9	54.0	1.197	3.960	168.0	.326	.456	7.440	Slightly turbid; earthy odor.....	72.10	....
July 16	258.4	48.1	1.197	5.660	148.0	.334	.526	9.680	Opalescent; yellowish; earthy odor.....	72.85	.30
" 23	280.5	49.2	.370	7.196	158.0	.256	.500	9.840	Opalescent; yellowish; earthy odor.....	77.00	....
" 30	275.0	42.1	.210	8.850	172.0	.332	.816	12.720	Opalescent; yellowish; earthy odor.....	81.57	3.00
Aug. 7	263.5	19.5	trace	12.390	200.0	.564	.612	7.520	Slight turbidity; yellowish; odorless.....	79.85	.50
" 13	314.9	47.0	.200	14.160	198.0	.352	.604	9.920	Opalescent; earthy odor; yellowish.....	68.50	.38
Sept. 17	290.0	17.2	2.016	19.470	201.0	1.334	.690	8.800	Slightly turbid; strong earthy odor.....	61.70	1.17
" 24	305.0	47.7	.960	19.586	208.0	.966	1.172	9.760	Slightly turbid; strong earthy odor.....	64.14	1.00
Oct. 1	368.8	65.2	.504	23.718	240.0	.972	.858	9.040	Opalescent; odorless..	53.00	.00
" 8	364.0	39.0	1.250	26.666	260.0	.888	.804	7.760	Nearly clear; earthy odor.....	51.14	.50
" 15	328.0	31.1	trace	25.844	252.0	.856	.536	8.000	Nearly clear; earthy odor.....	51.30	.03
" 22	339.2	40.6	1.396	32.760	246.0	1.320	.556	6.800	Slightly turbid; yellowish; earthy odor.....	46.00	1.62
" 29	319.2	43.3	1.134	31.860	224.0	.820	.382	6.720	Nearly clear; earthy odor.....	50.83	.25
Mean.	353.	84.3	.795	16.152	204.6	.645	.650	9.410			
1889.											
Feb. 4	357.6	22.8	1.898	16.753	.....	1.690	.962	9.80	Cattle shed odor; nearly clear.....	36.00	.05
" 11	341.4	8.0	trace	11.670	.....	1.620	1.160	9.90	Cattle shed odor; nearly clear.....	22.85	.10
" 19	357.4	21.5	3.100	16.520	.....	1.710	1.146	21.90	Cattle shed odor; opalescent.....	32.85	1.55
" 25	372.0	16.5	2.560	11.682	.....	1.810	.896	9.80	Strong cattle odor; nearly clear.....	15.83	.35
Mar. 4	356.0	62.4	trace	8.496	.....	1.826	1.056	11.10	Strong cattle odor; opalescent.....	36.10	1.10
" 11	328.0	129.7	.00	5.664	.....	.890	.870	176.50	Strong cattle odor; turbid.....	36.50	.00
Mean..	352.0	43.5	1.259	11.792	.....	1.591	1.015	13.358			

The increase in free and albuminoid ammonia and oxygen consumption is very marked in the winter tests at Pekin. The odor of the water was unmistakable and suggested at once the nature of the contamination.

The increase in suspended matter in March is due to the dilution with dirty water washed down by melting snow and ice.

A consideration of Tables XVII, XVIII, XX, XXI, and XXII will show the condition of the river below Pekin. Table XIX embraces results obtained by analysis of the water of the Sangamon River collected at Chandlerville.

\* Observer, J. E. Terborg, Pekin.



TABLE XVII.—COPPERAS CREEK (Illinois River).

Date. 1888.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness Ca(O <sub>3</sub> ) .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed .....	Physical Conditions.
May	16	297.5	19.3	.220	10.550	208.8	.102	.724	15.040	Turbid; earthy odor.....
June	20	293.2	46.2	.379	4.720	229.0	.192	.480	8.800	Slightly turbid; yellowish; earthy odor.....
July	4	299.9	43.5	.095	9.912	202.0	.196	.760	10.280	Yellowish; earthy odor.....
"	11	523.7	326.7	1.197	3.894	158.0	.144	.644	13.920	Very turbid; earthy odor.....
"	18	247.5	41.2	1.386	5.841	160.0	.166	.357	8.400	Opalescent; yellow; earthy odor
"	25	242.9	27.5	.125	8.496	190.0	.275	.394	10.560	
Aug.	15	330.0	40.9	.620	7.904	204.0	.386	.466	9.120	Nearly clear; yellow; earthy odor
"	24	292.5	41.9	trace	9.660	192.0	.020	.660	9.760	Nearly clear; organic odor; yel- lowish.....
Sept.	19	276.2	22.0	.....	16.638	220.0	.166	.760	6.960	Nearly clear; organic odor; yel- lowish.....
"	26	313.0	26.2	.....	19.647	212.0	.270	.723	17.840	Nearly clear; odorless; floating organic matter.....
Mean..		311.6	63.5	.402	9.726	197.5	.191	.596	11.068	

TABLE XVIII.—HAVANA (Illinois River).

1888.										
May	17	308.0	19.0	.126	11.780	237.0	.048	.645	11.760	Slight color; unusual odor.....
"	24	321.3	21.4	.504	10.620	233.9	.494	.346	8.160	Clear; earthy odor.....
"	31	465.9	274.7	.346	5.310	182.4	.086	.700	13.720	Muddy; ea thy odor.....
June	7	290.0	56.2	.819	3.860	198.0	.220	.389	8.160	Slightly turbid; yellowish; odor- less.....
"	14	283.2	21.0	.630	4.177	204.0	.186	.380	.....	Slightly turbid; yellowish; odor- less.....
"	21	312.4	45.6	.250	6.584	200.0	.270	.424	9.800	Yellowish; earthy odor.....
"	28	310.5	32.2	trace	5.876	224.0	.323	.426	9.760	Opalescent; earthy odor.....
July	5	292.0	23.7	.819	10.372	246.0	.207	.500	9.440	Nearly clear; odorless; slightly yellow.....
"	12	318.8	128.9	1.449	4.708	144.0	.036	.414	10.560	Very turbid; odorless.....
"	19	251.9	20.4	.630	5.664	160.0	.146	.334	8.480	Nearly clear; odorless.....
"	26	243.5	12.5	trace	5.320	192.0	.121	.380	8.720	Nearly clear; yellowish; earthy odor.....
Aug.	2	251.5	31.8	.160	7.080	172.0	.362	.430	9.040	Nearly clear; yellowish; earthy odor.....
"	9	283.4	42.3	.500	8.729	188.0	.452	.412	8.540	Nearly clear; yellowish; earthy odor.....
"	16	321.4	62.0	.580	10.974	196.0	.340	.400	8.400	Slightly turbid; yellowish; earthy odor.....
"	23	309.3	44.4	.740	17.524	190.0	.610	.576	8.800	Opalescent; yellow; earthy odor.
"	30	284.8	41.7	2.646	23.360	214.0	.384	.474	7.680	Slight earthy odor.....
Sept.	6	268.5	28.5	1.325	13.456	200.0	.546	.442	9.520	Opalescent; yellowish; earthy odor.....
"	13	274.2	37.8	.630	11.646	198.0	.496	.426	7.600	Nearly clear; earthy odor.....
"	20	304.0	32.2	1.008	12.380	204.0	.458	.468	7.520	Nearly clear; odorless.....
"	27	253.0	27.5	2.500	10.620	202.0	.480	.384	6.880	
* Oct.	4	.....	.....	.....	.....	.....	.....	.....	.....	
"	11	281.0	33.9	trace	22.656	220.0	.976	.408	6.800	Nearly clear; slight earthy odor.
"	18	288.4	10.5	.882	19.292	225.0	.530	.310	3.680	Nearly clear; odorless.....
"	25	354.0	17.7	1.008	20.178	256.0	.406	.322	6.960	Nearly clear; earthy odor.....
Nov.	1	371.8	25.3	trace	25.842	216.0	.040	.330	5.440	
Mean....		301.78	45.4	.731	11.583	204.2	.342	.430	8.142	
1889.										
Jan.	14	328.5	50.0	.000	16.496	.....	1.626	.375	8.600	Nearly clear; odorless.....
"	21	305.5	25.5	trace	8.260	.....	.642	.340	6.920	
"	28	317.0	24.7	1.20	9.416	.....	1.026	.440	5.120	"
Feb.	4	331.0	67.8	.750	.....	.....	.773	.730	7.400	Slightly turbid; earthy odor.....
"	11	312.0	21.7	1.180	9.086	.....	.845	.561	9.600	Nearly clear; slight earthy odor.
"	18	351.0	24.7	.125	16.166	.....	.820	.604	9.100	Nearly clear; earthy odor.....
"	25	317.4	13.8	.481	7.788	.....	1.015	.523	7.500	
Mar.	4	432.0	209.0	trace	7.430	.....	1.020	.692	14.42	Muddy; strong odor.....
"	11	477.0	289.8	trace	8.850	.....	1.940	1.008	14.45	
Mean .		352.4	80.8	.414	9.277	.....	1.078	.585	9.234	

\* Jug broken in transit.

TABLE XIX.—CHANDLERVILLE (Sangamon River.)

Date. 1888.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed .....	Physical Conditions.	*Total rainfall week ending — *Mean temper- ature — Week ending.....	
July	10	385.0	141.0	2.016	1.876	208.	.060	.322	5.800	Turbid; odorless.....	76.28	3.48
"	17	301.7	68.3	.900	9.583	186.	.049	.490	12.040	Turbid; earthy odor...	71.64	.77
"	24	334.9	79.0	1.131	2.124	226.	.010	.220	3.200	Cloudy; yellowish; odorless.....	74.00	.00
Aug.	1	330.8	134.5	.630	3.065	142.	.031	.400	7.200	Turbid; odorless.....	79.64	.34
"	8	298.9	43.0	.557	2.832	250.	.048	.218	3.760	Slight cloudiness; odorless.....	74.28	.91
"	15	274.8	48.2	.560	2.357	192.	.084	.222	4.960	Opalescent; earthy od'r	66.85	.09
"	23	307.4	28.7	trace	3.540	242.	.134	.172	3.680	Nearly clear; slight earthy odor.....	67.71	.08
Sept.	3	309.5	23.0	.250	3.500	250.	.010	.240	3.200	Nearly clear; earthy odor.....	65.28	.12
Mean....		317.8	70.7	.755	3.609	212.	.053	.285	5.480			

TABLE XX.—BEARDSTOWN.

May	21	320.2	42.2	1.320	7.67	216.0	.368	.382	7.52	Slightly yellowish; odorless.....	54.06	1.39
"	28	561.7	322.4	.630	6.112	212.4	.256	.540	9.520	River high; very turbid	67.96	2.28
June	4	325.5	131.0	.120	3.186	170.4	.176	.428	9.920	Muddy; odorless.....	60.45	.00
"	11	359.9	138.5	.693	3.540	154.0	.190	.474	8.80	Turbid; yellowish; earthy odor.....	70.92	1.05
"	18	322.8	79.4	.....	3.185	205.0	.086	.422	8.16	Nearly clear; odorless.	75.21	.69
"	25	307.6	95.7	.120	3.540	227.0	.142	.386	8.80	Turbid; yellowish; earthy odor.....	75.48	3.49
July	2	386.5	162.8	.350	4.141	204.0	.110	.410	8.640	Turbid; earthy odor...	72.36	1.31
"	9	308.9	119.9	.882	8.850	170.0	.141	.430	9.520	" "	79.50	3.02
"	16	281.1	83.4	.440	3.656	166.0	.108	.352	7.760	Slightly turbid; earthy odor.....	73.96	.72
"	23	236.3	38.5	.252	2.357	150.0	.092	.334	7.000	Cloudy; earthy odor...	73.51	.67
"	30	290.3	79.8	.105	3.540	176.0	.122	.310	7.360	Turbid; yellowish; earthy odor.....	80.30	1.67
Aug.	6	321.0	89.7	.252	5.780	200.0	.256	.356	5.840	Turbid; earthy odor..	79.74	1.28
"	13	425.7	174.6	.380	6.372	184.0	.307	.440	8.800	" "	68.41	.10
"	20	304.4	61.0	.560	8.496	196.0	.190	.510	6.640	" "	74.22	.20
"	28	318.5	60.8	trace	9.420	202.0	.142	.330	7.280	Nearly clear; odorless; yellowish.....	68.85	.56
Sept.	3	298.5	49.3	1.512	6.606	210.0	.222	.336	5.540	Slightly turbid; earthy odor.....	65.80	.06
"	10	282.0	37.5	1.008	10.620	216.0	.216	.330	7.520	Slightly turbid; earthy odor.....	69.89	.16
"	17	302.8	41.8	.....	8.850	220.0	.324	.508	8.500	Slightly turbid; earthy odor.....	60.26	.99
"	24	297.2	43.3	.504	12.623	230.0	.280	.384	5.280	Opalescent; odorless...	63.52	.79
Oct.	1	273.4	24.8	1.000	7.256	235.0	.191	.408	7.200	" "	55.02	.00
"	8	308.2	34.0	1.200	14.276	230.9	.260	.276	4.880	Nearly clear; earthy odor.....	52.08	.83
"	15	359.0	70.4	2.208	2.336	258.0	.248	.334	6.00	Slightly opalescent; slight earthy odor...	51.65	.09
"	22	287.0	34.5	1.512	19.401	256.0	.274	.262	5.44	Nearly clear; odorless.	47.04	.83
"	29	317.2	15.5	trace	17.70	230.0	.160	.188	4.66	" "	51.36	.31
Mean		390.	84.7	.62	7.524	204.9	.202	.380	7.354			

\*These observations were made by Sergeant John Craig, Signal Service, U. S. A., Springfield.—J. H. R.

TABLE XX.—BEARDSTOWN.—Continued.

Date.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness $\text{CaCO}_3$ .....	Free Ammonia	Alb. Ammoniac.	OXYGEN, consumed.....	Physical Conditions.	*Mean temperature, week ending.....	†Total rainfall week ending.....
1889.											
Jan. 14	314.1	59.0	.66	7.08	.....	.506	.256	6.300	Slightly turbid; odorless.....	28.00	1.65
" 21	329.2	46.5	1.134	10.652	.....	.238	.372	4.640	Slightly turbid; odorless.....	29.27	.61
" 28	341.2	97.0	1.960	4.070	.....	.300	.222	4.640	Slightly turbid; odorless.....	30.40	.00
Feb. 4	310.0	40.0	.665	4.460	.....	.242	.342	4.70	Opalescent; earthy odor	32.02	.00
" 11	316.4	43.0	trace	10.381	.....	.335	.560	5.70	" " "	23.58	.09
" 25	296.0	52.3	1.380	4.956	.....	2.950	.390	7.100	" " "	28.83	.37
Mean..	317.8	56.3	.966	6.933	.....	.702	.357	5.505			

†TABLE XXI.—ILLINOIS RIVER AT ALTON R. R. CROSSING NEAR PEARL.

1888.										†	†	
June	16	658.8	431.8	1.134	3.540	204.0	.058	.630	11.36	Muddy; earthy odor ..	75.28	.59
"	23	1134.4	918.0	trace	3.55	208.0	.091	.661	18.88	Muddy.....	78.64	2.62
"	30	670.0	458.9	.190	3.58	206.0	.012	.600	7.76	" " " "	75.64	1.56
July	7	447.8	214.2	1.134	5.416	218.0	.076	.458	12.00	Very turbid; earthy odor.....	84.64	.55
Aug.	11	386.7	139.7	1.768	6.842	196.0	.075	.426	10.560	Muddy; odorless.....	75.42	2.24
"	18	363.4	121.7	.485	6.726	210.0	.028	.340	61.400	Muddy; earthy odor ..	76.00	.05
"	25	339.7	92.5	1.323	5.310	190.0	.016	.358	7.000	Slight turbidity; slight earthy odor.....	71.71	.61
Sept.	1	326.9	68.4	.940	7.434	224.0	.078	.396	8.000	Slight turbidity; odorless.....	70.80	.60
"	8	295.4	34.7	1.134	8.275	202.0	.030	.430	6.720	Opalescent; odorless; yellowish.....	68.93	.01
"	15	312.0	42.7	.505	11.646	206.0	.022	.348	6.800	Opalescent; odorless ..	68.35	.40
"	22	304.0	60.2	trace	8.674	196.0	.129	.342	6.000	" " " "	66.00	2.76
"	29	282.0	33.3	.756	12.036	240.0	.127	.420	7.040	" " " "	59.50	.00
Oct.	6	290.0	50.0	.630	11.890	220.0	.102	.386	4.810	" " " "	56.80	.47
"	13	296.6	21.2	1.386	16.284	205.0	.057	.302	5.680	Slightly opalescent; odorless.....	54.00	.10
"	20	325.4	38.7	trace	12.376	240.0	.061	.366	4.720	Slightly turbid; odorless.....	53.80	.56
"	27	295.2	34.5	trace	15.930	250.0	.118	.286	5.120	Nearly clear; odorless.	50.00	.70
Mean .		402.5	172.5	.711	8.719	213.4	.067	.422	7.653			

\* These are means of observations made by P. J. Hasenstab at Jacksonville, and by L. Eastman at Griggsville.—J. H. R.

† These observations were made by P. J. Bates, Whitehall.—J. H. R.

† Mean temperature by months, at Kampsville, Calhoun Co., precipitation, and days upon which rain fell.

Temperature—May, 63° 7; June, 75° 8; July, 80° 3; August, 73° 6. Precipitation in inches, May, 6.12; June, 6.53; July, 3.75; August, 5.20. Days of rain, May, 2, 7, 8, 15, 18, 24, 26, 28; June 5, 7, 8, 9, 10, 22, 24, 25, 27; July 4, 7, 8, 9, 22, 25, 26, 27; August 4, 6, 7, 17, 20, 21, 25, 26. Dr. Southworth, Observer.—J. H. R.

TABLE XXII.—GRAFTON (Near Mouth Illinois River).

Date. 1888.	Total Solids..	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
June 20	321.9	94.0	.550	4.106	216.0	.094	.360	8.320	Turbid; odorless.....
27	290.5	97.6	.283	3.280	178.0	.108	.464	8.000	Odorless; turbid.....
July 3	313.7	65.6	.431	3.540	208.0	.637	.406	7.520	Slightly turbid; odorless.....
12	297.9	67.6	trace	6.018	178.0	.025	.470	8.560	Very strong and disagreeable odor; not natural.....
18	274.6	60.7	.442	3.773	168.0	.138	.390	8.640	Slightly turbid; odorless.....
Sept. 12	294.2	36.0	.....	5.522	205.0	.020	.810	*	Vinegar odor; bad jug.....
19	273.2	33.0	.....	11.328	218.0	.070	.636	14.400	Floating matter; jug not clean..
26	284.4	36.4	1.586	13.270	210.0	.043	.486	7.200	Odorless; nearly clear.....
Oct. 3	294.4	20.7	.590	12.390	222.0	.094	.344	4.800	.....
10	356.0	38.3	1.00	10.620	210.0	.200	.840	.....	Opalescent; (whisky jug).....
17	334.6	29.2	1.260	17.636	220.0	.164	.342	.....	.....
24	284.4	25.2	1.134	18.980	252.0	.156	.218	5.360	Nearly clear; earthy odor.....
Mean .	301.6	50.3	.582	9.205	212.4	.095	.483	7.300	.....
1889.									
Jan. 14	499.	47.0	.42	126.236	.....	1.138	.414	6.16	Opalescent; earthy odor.....
21	367.2	104.5	.367	33.90	.....	.870	.339	6.16	Opalescent; odorless.....
28	418.	.....	.000	10.62	.....	.290	.866	7.36	Turbid; odorless.....
Feb. 4	355.	110.	.000	5.905	.....	.450	.652	6.48	Turbid; organic odor.....
11	291.4	8.4	.000	8.614	.....	.450	.666	3.50	Clear; organic odor.....
18	353.	44.5	trace	8.260	.....	.554	.310	7.50	Nearly clear; earthy odor.....
25	359.	8.8	.000	7.580	.....	.550	.560	16.60	Clear, organic odor.....
Mar. 4	720.5	.....	trace	5.900	.....	1.10	1.560	15.28	Very muddy.....
11	334.0	78.5	.000	5.782	.....	2.47	1.135	14.320	Turbid; organic odor.....
Mean .	410.8	44.6	.087	23.644	.....	.875	.722	9.818	.....

During the earlier months high water made the results very irregular, with generally increased organic matter. On the whole, there seems to be no important change below Havana during the latter part of the summer, and it appears we reach here a condition in the river where the organic matter is very slowly changed. I have already referred to the organic matter remaining in a stream after a flow of a long distance as belonging, in all probability, to a very stable type. In the work of 1886 the portion of this residue left to be oxidized by the laboratory process was very much smaller than that left in 1888, and the reason for this difference can be found largely in the difference of temperature of the two seasons. The condition of the lower Illinois is, as regards residual organic matter, but little different from that of the Kankakee, Fox, Big Vermilion, or Little Vermilion, and I think we reach here the limit of oxidation practically possible under the conditions of temperature and dilution which obtained during the season.

The winter tests show many irregularities, but in general a less rapid rate of destruction of organic matter than during the summer. The condition of the water at Beardstown is apparently much modified by the flow from the Sangamon as the tests below this point indicate again an increase of albuminoid ammonia.

The water at Pearl was not in suitable condition for analysis until late in the summer. It was muddy until the middle of August, and, as the chlorine tests indicate, very greatly diluted by heavy rains and probably with backwater from the Mississippi. At Grafton we have, of course, a similar condition of affairs, although the turbidity was in general less marked where the low chlorine shows the same dilution. Undoubtedly a large proportion of the water here came from the Mississippi.

The samples sent from Grafton on January 14 and 21, show a large amount of chlorine suggesting some sort of contamination which I cannot now account for.

The work of 1886-87 shows to what a remarkable degree oxidation is dependent on temperature, and the same fact is brought out in the winter work of this year, though in less marked degree. I am therefore led to believe that in a warm season quite different results would be obtained by an examination of the lower Illinois.

By comparison of the results obtained in different seasons we are enabled to draw an important conclusion which at first sight may appear singular. In considering the results obtained in the summer when a very rapid decrease in organic matter is observed after the large pollution at Bridgeport, it has been urged that most of this decrease must be due to sedimentation. If this were true, then we should expect the most rapid decrease where the conditions favoring sedimentation are the most perfect. We have these perfect conditions during the winter when the surface of the water is covered with ice, or at any rate not disturbed by navigation.

The analyses show us, beyond a doubt, that instead of there being a decrease in the amount of organic matter in the river and canal under these conditions, there is a very great increase. The oxidation and albuminoid ammonia tests show often as much as, or even more, organic matter at Joliet and Morris than at Bridgeport, and a very greatly amount, as compared with the summer tests, at other points down the stream.

Giving these observations due weight, I think we can effectually dispose of the objection urged frequently of late, and from quarters where more accurate information should be expected, that the purification of a stream polluted by sewage is chiefly a work of sedimentation rather than of bacterial or other oxidation. In the winter season sedimentation undoubtedly plays by far the most prominent part in the disappearance of pollution; but for the summer months the evidence points to something else as taking the first place. In employing the various oxidation tests or the albuminoid ammonia tests, it must be remembered that other indications near the source of a great contamination are probably below the truth, while in the same stream, a hundred or more miles away from this contamination, organic matters present are in a more suitable condition to respond to the tests. It seems true, therefore, that these methods do not exaggerate the extent of purification in flowing water.

### THE MISSISSIPPI RIVER.

Tables XXII to XXXII inclusive, give the results obtained by analysis of the water of the Mississippi river collected at East Dubuque, Rock Island, Quincy, Alton, St. Louis, East St. Louis, Chester and Cairo.

TABLE XXII.—EAST DUBUQUE.

Date.	Total Solids..	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....	Physica Conditions.	Mean temperature — week ending.....	Total rainfall week ending.....
Oct. 16	185.0	13.6	.....	1.220	155.	.037	.210	4.480	Nearly clear; odorless.	.....	.....
" 23	190.2	13.8	.....	1.556	174.	.050	.102	4.320	" "	.....	.....
" 30	167.0	12.5	.....	1.416	150.	.072	.139	6.080	" "	.....	.....
Mean..	180.7	13.3	.....	1.397	159.	.053	.150	4.960			

TABLE XXIII.—ROCK ISLAND.

Sept. 17	207.4	47.0	.....	1.168	142.	.062	.328	6.800	Slightly turbid; yellowish; odorless.....	58.28	* .59
" 24	186.6	19.7	.....	1.180	160.	.031	.280	5.440	Nearly clear; odorless	58.85	.77
Oct. 1	189.0	23.2	.....	1.649	150.	.054	.200	4.800	" "	52.28	.00
" 8	186.0	15.0	.....	1.265	151.	.069	.196	7.200	" "	48.14	.10
Mean..	192.2	26.2	.....	1.315	151.	.054	.251	6.060			

TABLE XXIV —QUINCY.

Sept. 20	163.6	2.6	.....	1.168	144.	.091	.234	7.120	Clear; odorless.....	.....	.....
Oct. 11	197.0	22.0	.....	.930	150.	.049	.312	5.060	Opalescent; odorless.	.....	.....
Mean..	180.3	12.3	.....	1.049	147.	.070	.273	6.090			

\* Not enough water.

† Mean of last 14.

\*Observations U. S. Signal Service at Davenport.

TABLE XXV.—ALTON (River.)

Date. 1888.	Total Solids...	Suspended Matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.	Mean temper- ature for month.....	Total rainfall week ending.
July 19	394.1	193.7	.567	2.124	170.	.064	.420	11.520	Muddy.....	77.5	2.85
Aug. 2	299.7	132.1	.316	2.357	150.	.031	.434	8.000	Muddy; earthy odor..	73.5	.20
9	288.5	113.2	.....	2.655	146.	.134	.420	8.160	Very turbid; odorless..	.....	2.11
15	288.5	*	*	4.071	164.	.060	.422	8.800	" " " "	.....	.00
23	408.0	217.4	1.197	1.295	160.	.024	.396	8.000	" " " "	.....	.90
30	273.1	85.2	1.260	6.370	166.	.020	.316	7.520	Nearly clear; odorless.	.....	.12
Sept. 6	256.9	49.5	.....	4.127	168.	.018	.376	7.680	" " " "	64.0	.00
12	218.5	31.4	.....	3.657	152.	.032	.370	7.840	" " " "	.....	.00
20	228.8	33.2	.....	2.832	168.	.046	.478	7.200	" " " "	.....	.70
27	250.0	46.4	.....	4.480	180.	.038	.374	6.240	" " " "	.....	1.53
Oct. 4	247.6	54.5	.....	3.540	180.	.061	.366	6.900	" " " "	53.2	.00
11	238.6	26.4	.....	6.726	180.	.095	.262	6.400	Slightly opalescent; odorless.....	.....	.51
18	277.0	64.5	.....	4.841	180.	.096	.292	5.120	Nearly clear; odorless.	.....	.84
25	230.0	19.8	.....	6.520	190.	.093	.212	4.900	" " " "	.....	.92
Nov. 1	275.0	61.7	.....	5.664	188.	.066	.202	6.000	" " " "	.....	.00
Mean.	278.6	75.2	.....	4.083	169.4	.166	.356	7.356			
1889.											
Jan. 14	347.5	19.7	.000	5.664	.....	.464	.470	7.200	Muddy; odorless.....	.....	1.25
21	339.4	20.9	.88	5.876	.....	.452	.428	7.040	" " " "	.....	.12
28	324.4	19.1	.65	4.062	.....	.518	.306	5.120	" " " "	.....	.02
Feb. 4	402.0	234.5	1.008	.....	.....	.432	.367	7.12	Muddy; earthy odor...	.....	.00
11	312.0	53.2	trace	5.664	.....	.420	.296	5.520	Slightly turbid; odor's	.....	.00
18	377.	127.4	trace	5.651	.....	.438	.404	7.200	Muddy; odorless.....	.....	2.49
25	255.	16.0	trace	5.310	.....	.340	.251	6.100	Opalescent; odorless..	.....	.45
Mar. 4	122.3	.....	trace	8.614	.....	.316	.651	15.2	Very muddy; earthy odor.....	.....	2.98
Mean..	309.9	61.3	.317	5.834	.....	.422	.396	7.562			

\* Not enough water sent.

† Observations made by Dr. J. L. R. Wadsworth, at Collinsville.—J. H. R.

TABLE XXVI.—ALTON (Hydrant.)

Date. 1888.	Total solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.	Mean temper- ature week ending.....	Total rainfall week ending.
July 20	726.7	482.2	.567	5.133	160.	.084	.552	13.12	Muddy.....	.....	.....
Aug. 3	268.8	45.5	.200	1.062	180.	.023	.278	7.120	Turbid; odorless.....	.....	.....
10	268.8	32.1	*	3.540	166.	.118	.260	6.960	" " " "	.....	.....
17	241.8	13.6	.180	4.718	170.	.032	.250	7.840	Opalescent; odorless..	.....	.....
24	272.4	45.3	trace	4.248	166.	.032	.344	8.880	Slightly turbid; earthy odor.....	.....	.....
31	241.0	42.8	1.764	4.364	180.	.030	.284	9.200	Nearly clear; odorless.	.....	.....
Sept. 7	231.0	13.3	.....	4.956	166.	.026	.248	7.900	" " " "	.....	.....
13	262.6	68.5	.....	2.938	168.	.098	.360	6.320	" " " "	.....	.....
21	202.0	7.8	.....	3.656	186.	.044	.262	5.920	Clear; odorless.....	.....	.....
28	291.2	75.0	.....	4.070	190.	.048	.366	5.200	Opalescent; odorless...	.....	.....
Oct. 5	211.8	17.0	.....	3.894	174.	.050	.316	6.560	Nearly clear; odorless.	.....	.....
12	219.0	35.2	.....	4.956	160.	.107	.203	5.120	Opalescent; odorless..	.....	.....
19	229.6	24.5	.....	5.787	176.	.123	.172	3.680	" " " "	.....	.....
26	211.4	36.0	.....	6.018	184.	.053	.188	5.040	Nearly clear; odorless.	.....	.....
Nov. 2	216.2	10.3	.....	4.620	170.	.084	.132	4.400	" " " "	.....	.....
†Mean.	238.3	33.3	.....	4.202	174.	.062	.261	6.438			

TABLE XXVII.—ST. LOUIS (River)

Date. 1888.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
Oct. 9	788.8	482.2	.....	9.100	152.	.077	.133	8.720	Muddy; odorless.....	.....	.....
" 16	772.0	.....	.....	11.315	230.	.026	.252	6.480	" ".....	.....	.....
" 23	784.0	511.0	.....	9.027	232.	.022	.266	6.000	" ".....	.....	.....
" 31	.....	.....	.....	.....	.....	.006	.134	.....	" ".....	.....	.....
Mean..	781.6	496.6	.....	9.814	204.	.065	.197	7.066			

TABLE XXVIII.—ST. LOUIS (Basin).

Date.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
Oct. 10	365.4	.....	.....	9.364	205.	.042	.148	3.040	Turbid; odorless.....	.....	.....
" 17	395.0	.....	.....	8.000	196.	.016	.114	6.040	" ".....	.....	.....
" 23	444.8	.....	.....	9.204	210.	.048	.142	3.920	" ".....	.....	.....
" 31	.....	.....	.....	.....	.....	.079	.104	.....	" ".....	.....	.....
Mean..	401.7	.....	.....	8.856	208.	.046	.127	4.333			

TABLE XXIX.—EAST ST. LOUIS.—(Two miles from pump house, river)

Date.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
July 21	397.5	186.0	.....	2.584	.154	.036	.312	8.200	Muddy; odorless.....	*75.14	1.49
Sept. 28	332.6	146.5	.....	3.656	.148	.031	.202	8.240	" ".....	79.00	.33
" 15	407.4	157.7	.....	4.956	.198	.028	.316	5.920	" ".....	63.14	.06
" 22	350.2	158.6	.....	5.664	.176	.069	.384	6.000	" ".....	66.14	1.25
Oct. 6	261.4	29.0	.....	4.364	.184	.110	.302	5.360	Slightly turbid; odorless	55.71	.46
" 13	252.0	24.8	.....	4.248	.204	.049	.224	4.480	" ".....	52.14	.08
" 20	260.0	35.7	.....	4.732	.200	.029	.215	4.560	" ".....	52.7	1.29
" 27	257.0	24.8	.....	5.510	.224	.020	.168	3.680	" ".....	48.55	.76
Mean.	314.7	95.3	.....	4.476	.186	.046	.265	5.805			

TABLE XXX.—EAST ST. LOUIS—(Pump house.)

Date.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
July 20	1742.5	.....	.....	2.594	.....	.054	1.130	.....	Very muddy.....	.....	.....
Sept. 27	1302.2	.....	.....	3.005	.....	.060	.674	.....	" ".....	.....	.....
" 15	423.0	198.3	.....	4.602	.167	.028	.324	4.480	Muddy; odorless.....	.....	.....
" 22	347.0	137.2	.....	5.310	.188	.054	.344	5.600	" ".....	.....	.....
Oct. 6	303.4	66.2	.....	4.148	.196	.089	.264	6.800	Turbid; odorless.....	.....	.....
" 12	284.6	39.2	.....	5.890	.180	.049	.222	4.460	" ".....	.....	.....
" 19	273.2	51.0	.....	5.096	.180	.058	.222	4.080	" ".....	.....	.....
" 26	255.4	50.3	.....	4.956	.180	.050	.158	4.640	" ".....	.....	.....
Mean.	616.4	67.7	.....	4.457	.136	.055	.417	3.757			

TABLE XXXI.—CHESTER.

Date.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
Oct. 9	414.6	191.2	.....	6.200	.185	.065	.246	4.800	Muddy; odorless.....	.....	.....
No. date	490.0	.....	.....	7.644	.208	.098	.272	6.400	" ".....	.....	.....
Oct. 19	413.4	142.4	.....	7.640	.212	.067	.192	5.360	" ".....	.....	.....
Mean.	439.3	111.2	.....	7.161	.291	.076	.236	5.520			

TABLE XXXII.—CAIRO.

Date.	Total Solids...	Unspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alc. ammonia	Oxide con- tained.....	Physical Condition.	Mean tem- perature—week ending.....	Total rainfall week ending.....
Oct. 1	641.4	445.7	.....	7.778	.194	.072	.430	6.320	Muddy; odorless.....	†70.28	†.11
" 8	632.0	509.2	.....	7.080	.180	.084	.266	6.480	" ".....	64.71	.49
" 15	399.8	.....	.....	8.088	.215	.109	.496	12.480	" ".....	63.00	.49
Mean.	577.7	318.3	.....	7.648	.196	.088	.397	8.426			

\*Observations—U. S. Signal Service, St. Louis.

†Observations—U. S. Signal Service, Cairo.

The test at Alton show the effect of mixture with the water of the Illinois. There is evidently no increase in organic matter, comparing same dates, but a very perceptible increase in chlorine and hardness. During the winter the water was generally turbid, and characterized by an increase of free and albuminoid ammonia.

At East St. Louis we have a mixture of Mississippi, Illinois and Missouri river waters, and no great change from what is found at Alton. The proportion of Missouri water must be small.

The water sent from the river at St. Louis was too muddy for an accurate determination of some points. The increased chlorides, undoubtedly due to the Missouri, distinguish this from that taken on the opposite bank. The improvement in the settling basin is quite apparent but does not go far enough. The tests at Chester and Cairo show that the waters of the three streams have become more thoroughly mixed. The chlorides are higher than at Alton or East St. Louis, but lower than at St. Louis. There is apparently no increase in organic matter.

## THE OHIO RIVER.

In Table XXXIII we have the results of a few tests of Ohio river water at Cairo. The first three tests were made on the natural river water and the five following on the same water after filtration through a patented filter. The apparent increase of free ammonia may be due to the alum used as a coagulant. The oxidation and albuminoid ammonia tests show a reduction in organic matter, but less marked than was anticipated.

TABLE XXXIII.—OHIO RIVER, CAIRO.

### UNFILTERED.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 1	273.2	199.5	trace	3.894	66.	.038	.270	6.880	Muddy; yellowish; odorless....
" 8	185.0	88.8	0.00	1.416	71.	.038	.145	3.040	Turbid; odorless.....
" 15	167.0	62.5	0.00	4.004	.....	.174	.138	3.680	.....
Mean....	208.4	116.9	0.00	3.104	46.	.083	.184	4.533	

### FILTERED.

Oct. 9	164.0	3.6	0.00	1.777	75.	.050	.075	2.960	Clear; odorless.....
" 15	110.8	8.2	0.00	4.368	95.	.073	.082	2.960	
Mean....	137.4	5.9	0.00	3.069	85.	.061	.078	2.965	

### FILTERED AND AERATED.

Oct. 1	202.8	2.5	.....	2.236	80.	.109	.098	1.280	Clear; odorless.....
" 9	150.0	2.0	1.765	2.230	73.	.085	.083	3.840	
" 15	111.0	3.6	0.00	4.004	83.	.095	.086	2.520	" "
Mean....	154.6	2.7	0.00	2.823	78.	.096	.088	2.546	



## WATER FROM STATE INSTITUTIONS.

Several samples from each of the state institutions have been examined, the results of which are given below.

## KANKAKEE INSANE ASYLUM.

The water is taken from a filtering gallery, cut through sand rock for a distance of nearly one-fourth of a mile, parallel to the Kankakee river; also, in part from the river directly, as the filtered supply is not always sufficient. The analyses made are as follows:

TABLE XXXV.

Date. 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Sept.	18	244.8	18.2	.....	1.775	210.	.014	.372	16.160	Nearly clear; yellowish; odorless
	25	231.0	11.0	.....	1.770	216.	.057	.296	5.760	Clear and odorless.....
Oct.	2	251.2	17.0	.....	1.649	230.	.046	.280	5.840	Clear; earthy odor.....
	9	253.0	15.0	.....	2.000	206.	.054	.240	5.600	Clear; earthy odor.....
"	25	300.4	15.0	.....	3.150	254.	.016	.150	5.040	Nearly clear; odorless.....
M	...	256.1	15.2	.....	2.069	223.	.037	.267	7.680	

## ANNA INSANE ASYLUM.

This institution is supplied with surface water which collects largely in sink holes and passes by subterranean channels to a large cavern or natural reservoir. This is called the "spring." From there it is pumped into settling basins, where a great deal of earthy matter is deposited, and then to filter beds where it is thoroughly cleared. It is pumped into the building from the beds. The second and third tests indicate a fairly good water.

TABLE XXXVI.

Date. 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct.	13	160.6	4.2	.....	6.02	120.	.396	.122	2.40	Clear and odorless.....
"	20	171.6	1.5	.....	4.368	133.	.071	.174	2.56	" " "
"	27	199.2	1.5	trace	4.248	140.	.026	.100	2.40	" " "
Mean....		177.1	2.4	.....	4.878	131.	.164	.132	2.45	

## ELGIN INSANE ASYLUM.

The three samples analyzed were from a spring on the grounds. The water appears to be very good

TABLE XXXVII.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 18	358.0	9.0	trace	2.912	296.	.026	.069	.649	Clear and odorless.....
" 22	342.8	4.6	.....	4.586	316.	.012	.026	1.04	" " "
" 29	353.4	1.2	trace	2.890	290.	.028	.060	1.12	" " "
Mean....	351.4	4.9	.....	3.462	300.	.022	.051	.933	

## JACKSONVILLE INSANE ASYLUM.

The water used in this asylum is obtained from the town supply, described later. It is passed through a filter, which, to judge from the specimens examined, does not purify it as fully as is claimed. The large amount of free ammonia may come in part from the ammonia, alum used as a coagulant, but further tests are needed before pronouncing definitely upon the results of the filtration.

TABLE XXXVIII.

Date. 1888.	Total Solids...	Suspended Matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 15	193.0	2.0	.....	4.368	140.	.258	.190	4.080	Clear; strong earthy odor.....
" 26	207.4	3.2	.....	2.478	156.	.270	.404	5.060	Clear; odorless.....
" 31	191.0	31.1	.....	2.465	180.	.466	.486	5.920	Opalescent; odorless.....
Mean....	197.1	12.1	.....	3.103	158.	.331	.360	5.020	

## JACKSONVILLE DEAF AND DUMB ASYLUM.

The supply here is taken from the city and filtered. But two tests were made. These show less free ammonia, and about the same amount of albuminoid as is found in the asylum water.

TABLE XXXIX.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 30	172.2	3.5	.....	4.248	134.	.054	.388	5.680	Clear; odorless.....
" 30	240.6	51.5	.....	2.832	160.	.023	.380	5.920	Slightly turbid; odorless.....
Mean....	206.4	27.5	.....	3.540	147.	.038	.384	5.800	

## LINCOLN ASYLUM FOR FEEBLE MINDED CHILDREN.

The supply here is taken from the mains of the waterworks company. The company's wells are connected with filtering galleries, constructed a few years ago. I made two analyses of this water in September, 1887. They gave closely agreeing results. The results obtained from the first test were in parts per million:

Sodium chloride.....	3.8
Potassium chloride.....	12.6
Potassium sulphate.....	17.6
Calcium sulphate.....	11.6
Calcium carbonate.....	125.3
Magnesium carbonate.....	81.2
Ferric oxide and alumina.....	11.3
Silica.....	12.2
Free ammonia.....	.018
Alb. ammonia.....	.052
Oxygen consumed.....	.960

The water is supplied from a small stream and is evidently well filtered in the galleries. The recent tests do not indicate much change, except in the amount of oxygen consumed, as shown by the table below.

TABLE XL.

Date. 1888.	Total Solids...	Suspended Matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
Oct. 15	336.8	15.3	.....	5.460	290.	.005	.061	1.60	Clear; odorless.....
" 22	308.0	15.1	.....	5.824	290.	.008	.092	3.29	Yellowish; odorless.....
Nov. 3	333.0	2.5	.....	5.540	276.	.034	.047	2.80	Clear; odorless.....
Mean..	325.9	10.9	.....	4.941	285.	.015	.066	2.53	

## PONTIAC REFORM SCHOOL.

This water supply is taken from a well, which is 24 feet deep sunk through strata of sandy loam and sand; 150 feet from the well there is an artificial pond, supplied by water from an artesian well. This water is heavily charged with salt, which possibly suggests the source of supply of the shallow well, as the water here shows a large amount of chlorides. The privy vault is 400 feet from the well.

TABLE XLI.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Free Ammonia	Oxygen con- sumed.....	Physical Conditions.
Oct. 17	1609.4	16.0	.....	480.48	536.	.421	.116	1.84	Nearly clear; odorless.....
" 29	1582.0	7.1	.....	495.60	504.	.048	.081	2.32	Clear; odorless.....
Nov. 2	1829.8	8.9	.....	584.10	528.	.294	.038	2.16	" " " " " " " " " " " "
Mean..	1673.7	10.6	.....	520.06	522.	.254	.078	2.10	

## CHESTER STATE PRISON.

The supply here is rain water. Two samples tested had been filtered, and two not; the filtered water is of good quality.

TABLE XLII.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
Oct. 15	122.0	15.1	.....	.354	62.	.088	.352	10.800	Clear.....
22	95.8	3.4	trace	.724	75.	.105	.350	9.840	Yellowish; organic odor.....
Mean..	108.9	9.2	.....	.539	68.5	.096	.351	10.320	

## FILTERED.

Oct. 22	66.2	.....	.....	.603	42.	.008	.042	1.920	Clear; odorless.....
29	75.2	1.3	.....	.708	40.	.006	.046	2.400	.....
Mean..	70.7	.65	.....	.655	41.	.007	.044	2.160	

## JOLIET STATE PRISON.

The supply of the Joliet Penitentiary is obtained from two artesian wells, one 553 feet deep and the other 1,948 feet deep. The flow from the former stopped during the autumn and at the present time the deep well furnishes all the water used. The three tests show marked variations in the quality of the water. Free ammonia is usually found in large quantity in artesian waters but the albuminoid in this well is very high and suggests the propriety of further investigation.

TABLE XLIII.

Date. 1888,	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
Oct. 13	794.6	2.00	.....	233.64	220.0	14.160	.420	1.600	Clear and odorless.....
20	810.4	2.30	Trace	224.20	300.0	3.323	.920	2.240	.....
29	695.8	1.00	.....	141.60	206.0	2.360	.240	3.840	.....
Mean..	766.9	1.76	.....	199.80	242.0	5.616	.526	2.560	

## NORMAL, SOLDIERS' ORPHANS' HOME.

The water supply is furnished by a well on the grounds 105 feet deep, 60 feet of which is 7 feet in diameter and alled up with brick and timber. Below this is 45 feet of 7 inch iron pipe and a strainer at the bottom. The water is not filtered before use. It seems to be somewhat similar to that of Bloomington, referred to be ow. At the present time from 800 to 1,000 barrels per day is furnished.

TABLE XLIV.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
Jan. 14	456.5	9.0	1.650	3.240	.....	.885	.133	2.320	Clear; o. orless.....
20	419.0	10.4	2.010	1.765	.....	1.064	.131	2.96	.....
29	385.0	22.2	2.898	1.750	.....	1.232	.079	2.56	.....
Mean .	420.2	13.86	2.186	2.226	.....	1.060	.114	2.61	

## TOWN SUPPLIES.

## JACKSONVILLE.

The usual supply is surface water, collected in a ravine. A dam across this forms a basin, out of which the mains are filled.

In dry weather, the "Davenport" well, so called, is used. This well is an abandoned coal shaft, 210 feet deep. Working it for coal was given up because of the great amount of water which collected.

An artesian well is also used in dry weather. It is 2,400 feet deep and discharges 120,000 gallons of water daily.

The tests show that the surface water is far from satisfactory. The one analysis of the Davenport water indicates much organic matter in solution. The artesian water is very hard and heavily charged with salt.

TABLE XLV.

Date, 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....	Physical Conditions.
Oct. 15	774.6	472.7	.....	2.548	160.	.192	.195	29.92	Turbid; very strong earthy odor.
" 25	292.2	.....	Trace	5.542	186.	.050	.620	12.64	Turbid; odorless.....
" 26	197.0	2.1	.....	5.510	160.	.128	.424	6.80	Clear; ".....
" 30	275.0	.....	.....	3.894	184.	.072	.480	14.560	Turbid; ".....
" 31	210.0	9.4	.....	2.832	160.	.045	.482	7.360	Slightly turbid; earthy odor....
" 29	252.2	1.1	.....	934.5	460.	1.228	.016	2.800	{ Artesian well—Clear and odor-
" 29	2591.2	1.5	.....	1005.4	470.	1.428	.280	3.440	{ less.....
" 30	1191.6	52.4	.....	169.92	436.	2.508	.290	6.560	Davenport well—Nearly clear; odorless.....

## AURORA.

The water supply of Aurora is taken from the Fox river, and is drawn from an island in the river, 1,200 feet long and 200 feet wide. In the center of the island is a conduit or gallery 800 feet long, made by excavating to the rock 12 feet down and building up a wall of rubble stone on each side, covered on the top with hemlock joists set on edge and one-half inch apart, the joists are in turn covered with gravel and soil. The conduit thus formed has a section of 4 feet, and is connected by a pipe with the pumping works a mile north of the city. In the winter about 300,000 gallons daily is pumped, while in the summer the amount is increased to from 1,500,000 to 2,500,000 gallons, the tests are as follows:

TABLE XLVI.

Date, 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed.....	Physical Conditions.
Sept. 21	288.0	2.6	.....	2.124	260.	.068	.208	3.760	Clear and odorless.....
" 28	296.6	2.6	Trace	2.478	294.	.084	.206	4.160	".....
Oct. 5	299.4	2.5	.....	2.365	282.	.048	.196	4.000	".....
" 13	326.0	5.8	.....	2.832	308.	.064	.148	4.000	".....
Mean..	302.5	3.4	.....	2.449	261.	.066	.189	3.980	

## FREEPORT.

The supply is from eighteen artesian wells tubed to a depth of 44 feet. At the surface these pipes are connected with a 16-inch main. The water is hard, but otherwise good.

TABLE XLVII.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Sept. 25	456.0	1.0	5.540	12.506	454.	.032	.086	1.360	Clear and odorless.....
Oct. 2	470.6	1.8	9.324	14.160	434.	.038	.049	.720	" " .....
" 9	537.0	1.0	5.160	11.790	448.	.040	.076	1.600	" " .....
" 16	448.4	3.2	5.040	13.104	405.	.013	.031	7.776	" " .....
Mean..	475.5	1.7	6.266	12.890	435.	.031	.060	2.866	

## ELGIN.

The Elgin water is taken from the Fox river, and is passed through filters. At the time the samples were collected these filters were not working well. The large amount of free ammonia in two of the samples tested came from the ammonia alum employed as a coagulant in the filters.

TABLE XLVIII.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Sept. 24	269.	2.2	.....	1.775	290.	.510	.316	4.560	Clear and odorless.....
Oct. 8	266.	1.2	trace	5.372	282.	.053	.296	4.800	" " .....
" 19	264.6	2.7	.....	2.548	276.	.233	.214	2.640	" " .....
Mean..	266.5	2.0	.....	3.232	282.	.265	.275	4.000	

## PEORIA.

A part of the water used in the city is taken from the Illinois river, and has already been described. A portion of the drinking water used is furnished by springs in the higher part of the city.

An experimental well known as the "city well" furnishes water which could not be used as it is badly contaminated and yellow. A series of analyses was made of the water from a well 33 feet deep, at the upper sugar works, and also from a driven well 70 feet, at the Monarch distillery. The direct indications of organic matter are not pronounced in either case, but the nitrates and chlorides of the well at the sugar works suggest strong contamination with oxidized sewage. At the distillery well the indications are much less pronounced. These wells are both near the river.

TABLE XLIX.—"CITY WELL," (not in use.)

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed .....	Physical Conditions.
Aug. 7	796.2	7.5	8.075	79.175	544.	.179	.120	1.120	Clear; odorless.....
22	715.5	19.5	1.134	60.767	500.	.242	.290	4.720	Slight opalescence; odorless.....
Sept. 20	670.8	24.4	.756	81.066	374.	.144	.198	4.800	Yellow; turbid; odorless.....
27	664.6	41.2	3.780	70.920	400.	.454	.152	4.000	.....
Oct. 4	687.0	48.2	trace	81.774	414.	.346	.136	2.720	Yellow; tu bid; earthy odor.....
10	696.4	31.3	1.512	71.150	324.	.484	.192	2.800	Yellowish; odorless.....
Mean .	704.7	27.6	2.543	74.142	426.	.308	.181	3.360	

## WELL AT MONARCH DISTILLERY.

June 1	371.5	4.5	7.875	2.944	310.8	.002	.037	.960	Clear; odorless.....
Aug. 21	373.0	4.5	7.560	.587	306.0	.144	.188	.416	Clear; yellowish; odorless.....
Sept. 20	424.6	4.0	5.560	2.710	314.0	.046	.028	1.120	Clear; odorless.....
27	399.0	3.2	7.300	2.700	314.0	.047	.030	.960	.....
Oct. 4	432.6	1.7	7.560	2.832	350.0	.027	.091	.720	" " .....
10	416.0	4.1	6.426	2.340	320.0	.047	.059	1.920	" " .....
Mean .	402.8	3.6	7.380	2.350	319.1	.035	.072	1.016	

## WELL AT UPPER SUGAR WORKS.

June 1	761.4	2.5	11.970	61.950	480.0	.012	.014	1.44	Clear; odorless.....
Aug. 21	678.2	1.0	18.900	41.524	496.0	.017	.021	1.12	Clear; colorless; odorless.....
Sept. 20	784.0	2.0	11.592	33.509	486.0	.015	.054	1.20	Clear; odo less.....
27	637.8	1.3	8.825	35.400	520.0	.077	.080	1.20	" " .....
Oct. 4	731.9	3.0	8.568	30.444	490.0	.122	.400	1.68	" " .....
10	680.0	6.5	4.788	36.820	496.0	.389	.088	1.92	Clear; organic odor.....
Mean .	712.0	2.7	10.773	34.941	494.6	.105	.119	1.42	

## BEARDSTOWN.

The samples sent from this city were obtained from two artesian wells. They are heavily charged with salt, and when allowed to stand throw up a layer of oil.

TABLE L.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed .....	Physical Conditions.
July 9 (1)	6480.3	10.0	.....	3405.5	302.0	2.900	.112	17.360	Clear; oily odor.....
" 16 (1)	6200.5	3.5	.....	3143.5	296.0	3.782	.326	18.320	" " .....
" 9 (4)	11219.2	4.7	.....	6230.4	548.0	3.836	.088	10.560	" " .....
" 16 (4)	10797.0	28.8	.....	4956.0	480.0	5.696	.128	13.920	" " .....

## BELLEVILLE.

The supply is surface water collected by a creek, and from springs. The water accumulates in a storage reservoir and is filtered to the city mains. The appearance of the water is much improved by the filtration, but a certain amount of organic matter is still found in it.

TABLE LI.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Sept. 18	162.0	21.3	.....	2.124	130.	.184	.560	7.200	Reservoir, slightly turbid; yellowish.....
Oct. 24	161.4	22.7	.....	2.003	118.	.065	.570	4.560	New reservoir; clear.....
Sept. 10	136.0	19.4	.....	4.248	80.	.070	.516	7.600	Stand pipe filtered.....
Sept. 18	149.4	5.8	.....	1.775	125.	.160	.354	5.600	Stand pipe filtered, aerated.....
Oct. 18	144.6	3.1	trace	1.770	124.	.042	.287	5.600	Hydrant, clear; organic odor.....
Oct. 24	155.2	4.4	trace	2.360	128.	.058	.370	5.040	Market place well, clear.....
Oct. 18	1234.0	3.1	15.620	90.386	892.	.028	.116	2.240	Wells in different parts of the city.....
Oct. 18	1902.4	4.5	35.280	226.560	1130.	.064	.050	2.640	Spring water.....
Oct. 10	2029.0	4.6	11.718	207.090	.....	.144	.280	3.600	
Oct. 10	1672.6	5.1	65.520	161.430	852.	.048	.050	7.080	
Sept. 18	1575.0	8.2	60.480	141.600	980.	.010	.088	2.320	

## GALENA.

The water is obtained from an artesian well 1507 feet deep, having a diameter of 8 inches, the flow is 2,000 gallons per minute. These tests show a satisfactory degree of purity.

TABLE LII.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 11	271.6	2.8	.....	.567	270.	.169	.062	2.320	Clear; odorless.....
Oct. 18	295.0	2.6	.....	.708	264.	.105	.059	3.200	" " ".....
Oct. 27	285.8	3.6	.....	.560	270.	.022	.020	.800	" " ".....
Nov. 10	292.0	1.7	.....	.587	.....	.006	.105	2.240	" " ".....
Mean	286.1	2.6	.....	.605	201.	.075	.061	2.140	

## DANVILLE.

The supply is from a small river, and is not filtered. It has the same character as waters found in similar streams in all parts of the state.

TABLE LIII.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
Oct. 18	356.6	15.5	.....	3.276	324.	.044	.172	3.040	Nearly clear; odorless.....
Oct. 25	299.2	6.6	.....	2.834	290.	.010	.068	2.960	" " ".....
Nov. 5	297.6	.....	.....	2.900	240.	.086	.198	4.240	" " ".....
Nov. 5	395.0	.....	.....	2.830	304.	.192	.198	3.480	" " ".....
Mean	337.1	11.0	.....	2.960	289.	.060	.159	3.430	



## PEKIN.

The water is furnished by driven wells sunk to a depth of 75 feet, through a soil consisting chiefly of sand and gravel. The tests show a very satisfactory degree of purity.

TABLE LIV.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed .....	Physical Conditions.
May 21	335.6	1.0	4.536	2.230	252.0	.004	.054	.32	Odorless; colorless.....
28	328.3	3.2	4.914	3.186	283.2	.020	.026	.20	" " .....
June 6	328.3	2.5	5.229	3.433	290.0	.008	.022	.72	" " .....
11	575.0	19.5	.660	2.570	286.0	.004	.036	1.12	Deposits a little iron on standing
Mean .	341.8	6.5	3.834	2.854	277.8	.009	.034	.59	

## MORRISON.

The supply is from a large well, and is shown by the tests to be of good quality. The well was sunk in 1881 around a large spring flowing out from a bluff on one side of Rock Creek bottom, a short distance from the city. The inside diameter of the finished well is 36 feet. It was sunk to the rock 12 feet below the surface, and three feet of this rock was afterwards excavated. In order to prevent overflow and contamination by the spring freshets, the wall was built up about 20 feet higher and the bluff graded down around it. The water stands 15 to 16 feet in depth and is always fresh and clear. Two overflow pipes, 2 and 4 inches in diameter carry off water nearly all the time.

The supply for the city, estimated at 800 gallons per minute, is pumped to a large wooden tank or reservoir and there distributed by mains.

TABLE LV.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed .....	Physical Conditions.
Sept. 14	397.4	4.1	10.690	9.416	360.	.008	.022	.400	Clear; odorless.....
24	379.4	3.5	3.276	4.718	340.	.010	.036	1.040	" " .....
Oct. 1	379.6	3.3	5.040	8.496	346.	.013	.019	1.520	" " .....
8	405.4	1.2	6.680	7.313	348.	.008	.055	1.440	" " .....
Mean .	390.4	3.0	6.421	7.485	348.5	.009	.033	1.100	

## JOLIET.

The water furnished the city is obtained at the present time wholly from artesian wells. There are three of these wells having a depth of 1,200 feet, and the amount flowing is considered sufficient for present needs.

Three of the tests given below show good results, in the one of July 26th the result is not as favorable owing to what must have been an accidental contamination of the water.

TABLE LVI

Date.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine .....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed .....	Physical Conditions.
July 12		491.4	12.5	.630	8.850	340.0	.038	.105	2.880	Clear .....
" 19		429.5	4.5	.442	9.437	326.0	.044	.053	2.640	" .....
" 26		474.2	28.6	.316	8.238	316.0	.010	.360	12.080	Floating matter; probably accidental .....
Aug. 2		438.4	5.2	.550	6.726	314.0	.014	.082	1.600	Clear and odorless .....
*Mean.		453.1	7.4	.541	8.337	326.6	.032	.080	2.373	

\*Not including July 26.

## GALESBURG.

The city supply is taken from a large well. The tests show a large amount of free ammonia with small albuminoid and low oxygen consumption and chlorides.

I have made other full analyses of this water, and find that it deposits iron on standing in the air. After such deposition it is almost entirely free from organic matter and is, apparently, quite suitable for use. But it is claimed that in pumping from this well others in the neighborhood are immediately drawn dry. As the soil is evidently porous, consisting of gravel and loam I am informed, and as sources of contamination are not far removed, it may be necessary to carry out fuller and prolonged tests to determine the nature of the water.

The following is a full analysis of the water, in parts per million.

Silica .....	19.3
Ferrous carbonate and alumina .....	65.0
Calcium sulphate .....	5.7
Calcium carbonate .....	166.2
Magnesium carbonate .....	86.8
Sodium carbonate .....	25.8
Potassium carbonate .....	7.4
Sodium chloride .....	2.1
Total solids .....	378.3

The recent special tests gave results as follows:

TABLE LVII.

Date, 1888.		Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine .....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen consumed .....	Physical Conditions.
Sept. 19		413.2	14.7	.....	1.180	350.	.848	.150	2.800	Nearly clear; odorless .....
" 28		396.4	21.0	.....	1.180	368.	1.004	.086	2.000	Iron deposits on standing; odorless .....
Oct. 6		396.4	8.0	.....	1.181	384.	.890	.092	2.400	Clear; odorless .....
" 13		391.4	1.8	.....	1.198	380.	1.000	.123	2.400	" .....
Mean .		399.3	11.3	.....	1.184	370.	.935	.112	2.400	

## BLOOMINGTON.

Some years ago a company attempted to bore for coal at this place, but at a depth of 25 feet encountered a bed of coarse gravel through which the water came in in such quantities that the work had to be abandoned.

In 1874 the city sunk a well 40 feet in diameter and 28 feet deep at this point and obtained a good supply. This was increased in 1886 by sinking 7 eight-inch pipes around the outside of the well to a depth of 62 feet, and 3 similar pipes from the bottom of the well. The water rises and flows into the well from the last, while the seven are connected in such a manner that they can be used alone or in connection with the water of the well proper.

The citizens of Bloomington speak in the highest terms of the excellence of the water.

TABLE LVIII.

Date, 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammon.	Alb. Ammon.	Oxygen consumed.....	Physical Conditions,
Sept.	17	643.0	2.8	.....	5.310	582.	.922	.074	1.280	Clear; odorless.....
	24	562.8	9.2	.....	3.894	452.	.952	.137	1.920	" " .....
Oct.	1	593.8	1.2	.....	3.894	460.	.950	.077	2.720	" " .....
	8	615.0	1.1	.....	4.000	464.	.908	.042	1.360	" " .....
Mean.		603.6	3.5	.....	4.249	489.	.933	.082	1.820	" " .....

## SPRINGFIELD.

The Springfield waters examined were obtained from several sources. In February March and April a number of cases of typhoid fever occurred at Concordia College, and as the disease was becoming epidemic, the college was closed on April 23, 1888.

Eight of the students fell sick upon reaching their homes, of whom four died. There was a total of forty cases and twelve deaths. The well water was suspected and its use forbidden, and directions given that the institution should be thoroughly cleaned and purified. Upon opening of the college in September last the water of the well was, however, again used. No doubt in consequence of this and other causes, another outbreak occurred in February, 1889, twenty-three students falling ill with fever. The attendance falling off from 174 to 53 students. Another analysis of the water was made in February. The four samples sent from the so-called new well—one much used for drinking purposes—show, by analysis, a large amount of dissolved solid matter, with abundance of nitrates and chlorides. The last three ammonia and oxidation tests do not indicate an excessive amount of organic matter. It is probable that this has been mostly decomposed by the soil.

Water from three other wells in the immediate vicinity was examined. These are marked "old well," "well in pasture," and "well in professor's yard," and the tests here indicate a lower amount of solids, nitrates and chlorides. The free ammonia in the last two is high. It is interesting, to note the change in the water of the "new well" between June 1 and June 15. We have a marked decrease in oxidation and in albuminoid ammonia, with a corresponding increase in nitrates. The mineral matter taken up from the soil is also increased. I am inclined to believe that the nitrates in the other wells are in excess of what should be found in ordinary wells of that locality.

The other waters tested were from the Sangamon river; from the hydrant in the office of the State Board of Health, before the water was pumped from the new well; and two samples from the well before the water was pumped from it, and the last from a hydrant at Concordia College, from the public supply drawn through the filtering gallery. The filtering gallery is about a thousand feet in length, running back from the

Sangamon river toward a bluff. It is constructed at a depth of 20 to 25 feet below the surface, and in sand and gravel. The water is not furnished by the river, but from below the bluff. Occasionally it is necessary to pump a little directly from the river, as the daily average of 2,600,000 gallons cannot be furnished by the gallery itself. The "new well" at the pump house, from which some samples were taken, is connected with the gallery. The analyses show the improved character of this water as compared with the water heretofore directly obtained from the Sangamon river, and will, no doubt, show more improvement when the gallery furnishes all the water.

TABLE LIX.  
CONCORDIA COLLEGE—New well.

Date. 1888.	Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed.....	Physical Conditions.
1888.									
June 15	1596.4	6.5	9.450	102.66	102.00	.018	.186	15.840	Clear; odorless.....
Sept. 4	1888.0	trace	22.680	111.156	132.00	.004	.092	4.840	" " .....
1889.									
Feb. 22	1876.0	4.8	22.050	101.123	136.00	.008	.082	3.600	" " .....
Mean..	1761.0	trace	19.530	145.140	.....	.045	.072	2.400	" " .....
	1780.3	2.8	18.427	115.019	123.33	.019	.108	6.670	

WELL IN PROFESSOR'S YARD.

1888.									
Sept. 4	555.4	3.0	15.435	22.181	.384	.142	.104	2.160	Clear; odorless.....

WELL IN PASTURE.

Sept. 4	629.4	14.3	18.900	21.240	.440	.548	.161	2.720	Clear; odorless.....
---------	-------	------	--------	--------	------	------	------	-------	----------------------

OLD WELL—NOT USED.

1888.									
June 15	698.4	trace	15.120	15.222	.665	.006	.028	1.440	Clear; odorless.....
Sept. 5	671.5	22.5	13.860	21.473	.568	.002	.055	1.120	Opalescent .....
Mean..	684.9	11.2	14.490	18.347	.616	.004	.041	1.280	

HYDRANT—STATE BOARD OF HEALTH OFFICE.

1888.									
Aug. 25	252.5	14.5	trace	2.948	.178	.010	.358	5.760	Nearly clear; earthy odor.....
Sept. 5	288.7	35.2	trace	4.127	.230	.012	.218	4.240	Slight turbidity; yellowish; odor- less.....
Oct. 10	305.8	20.2	trace	6.726	.248	.022	.186	3.283	Colorless; odorless .....
Mean..	282.3	26.3	.....	4.600	.218	.014	.254	4.127	

HYDRANT—ST. NICHOLAS HOTEL, DECATUR.

Sept. 12	364.3	5.000	.....	6.018	320	.056	.194	3.040	Clear; bad odor ....
----------	-------	-------	-------	-------	-----	------	------	-------	----------------------

## SANGAMON RIVER.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed .....	Physical Conditions.
1888. Oct. 12	295.8	11.8	trace	7.080	250	.113	.208	3.360	Nearly clear; slight earthy odor.

## NEW WELL, PUMP HOUSE.

Sept. 13	377.4	24.8	trace	2.584	310	.454	.076	1.286	Yellow; turbid; odorless.....
Oct. 11	349.0	22.1	trace	5.310	280	.363	.093	2.320	Yellow; turbid; organic odor....
Mean..	363.2	23.4	.....	3.947	295	.408	.084	1.800	

## CONCORDIA COLLEGE—HYDRANT.

1889. Feb. 22	328.0	trace	.00	4.956	.....	.219	.095	3.600	Clear; odorless.....
------------------	-------	-------	-----	-------	-------	------	------	-------	----------------------

## DECATUR.

A large number of analyses were made of waters from different public school wells and from several others in the city. These wells have generally a depth of 40 to 70 feet and are sunk first through 14 feet of yellow clay and then through a stratum of blue clay of variable thickness to a gravel bed.

These wells present several interesting features for study. It will be seen by the tests below that the waters of most of them are pretty hard and contain considerable amounts of chlorine and nitrates. The oxidation and ammonia tests do not show much organic matter actually existing. Local authorities suggest that these gravel beds, into which the wells are sunk, are connected with each other as wells have been drawn dry by pumping from others.

The large chlorine and nitrates suggest contamination with oxidized products of animal origin and if the wells are in communication, there may be found in this a source of future danger.

The Lincoln Square well is of different nature. Its water appears good.

The hydrant water is from the Sangamon river, and contains the usual constituents.

## TABLE LX.

## WOOD STREET SCHOOL.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates .....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia.	Oxygen con- sumed .....	Physical Conditions.
Aug. 29	609.	trace	11.970	21.800	448.	.002	.016	.880	Clear; odorless.....
Sept. 5	619.	..	13.860	24.782	510.	.008	.050	1.600	" " .....
12	673.2	..	6.048	21.594	490.	.013	.050	1.120	" " .....
Mean..	633.76	.....	10.626	22.725	482.6	.0076	.0386	1.200	

†The following is the mean of eight analyses of water, July-September, at Chandler-ville (Sangamon river): Total solids, 317.8; suspended water, 70.7; nitrogen in nitrates, 755; chlorine, 3.609; hardness, ca CO<sub>3</sub> 212; free ammonia, .053; alb. ammonia, .285; oxygen consumed, 5.480.

## CHURCH STREET SCHOOL.

Physical Conditions.										
Date. 1888.		Total Solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed .....	
Aug.	29	879.7	trace	13.860	53.210	580.	.003	.054	3.680	Clear; odorless.....
Sept.	5	879.3	"	10.395	50.268	616.	.002	.061	4.650	" " .....
	12	896.4	"	10.132	53.100	620.	.002	.070	2.400	" " .....
Mean..		885.1	.....	11.462	52.192	605.3	.0023	.0616	3.576	

## CHAMBERS' LOT.

Aug. 29	986.2	trace	25.200	96.303	644.	.004	.058	4.000	Clear; odorless.....
Sept. 5	988.2	"	27.090	63.120	690.	.178	.124	8.000	" " .....
12	1026.0	"	25.704	85.668	700.	.014	.084	1.600	" " .....
Mean..	1000.1	.....	25.998	81.727	678.	.0653	.088	4.533	

## JACKSON STREET SCHOOL—NORTH WELL.

Aug. 29	746.8	trace	26.480	33.120	548.	.008	.070	1.920	Clear; odorless.....
Sept. 5	779.7	"	24.570	29.498	536.	.008	.104	2.080	" " .....
12	774.0	"	23.940	29.558	500.	.024	.076	2.240	" " .....
Mean..	766.8	.....	24.996	30.725	528.	.013	.083	2.080	

## JACKSON STREET SCHOOL—SOUTH WELL.

Aug. 29	668.8	trace	17.010	26.311	544.0	.002	.042	2.000	Clear; odorless.....
Sept. 5	648.5	"	15.750	26.196	500.	.002	.085	2.720	" " .....
12	682.4	"	13.608	26.550	544.	.006	.098	2.080	" " .....
Mean..	666.5	.....	15.456	26.352	529.3	.0033	.075	2.266	

## JASPER STREET SCHOOL.

Aug. 29	780.5	trace	19.530	28.319	568.	.002	.014	2.240	Clear; odorless.....
Sept. 5	733.4	"	18.585	22.418	600.	.002	.068	2.240	" " .....
12	744.4	"	19.104	25.234	580.	.007	.058	1.520	" " .....
Mean....	752.7	.....	17.073	25.327	582.	.0036	.0466	2.000	

## SANGAMON STREET SCHOOL—EAST WELL.

Aug. 29	1661.4	trace	23.310	170.512	1040.	.012	.058	2.960	Clear; odorless.....
Sept. 5	1616.7	"	23.310	141.600	980.	.002	.095	2.880	" " .....
12	1406.4	"	35.280	109.470	890.	.002	.092	2.960	" " .....
Mean..	1561.5	.....	27.300	140.527	970.	.0053	.0816	2.933	

## SANGAMON STREET SCHOOL—WEST WELL.

		Physical Conditions.								
Date. 1888.		Total solids...	Suspended matter.....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	
Aug.	29	1589.5	trace	17.640	207.670	920.	.004	.056	3.360	Clear; odorless.....
Sept.	5	1605.7	..	18.900	135.698	950.	.002	.075	1.920	..
	12	1604.	..	30.744	197.530	990.	.010	.108	2.800	..
Mean..		1599.7	.....	22.428	180.299	953.	.0053	.0796	2.693	

## MARIETTA STREET SCHOOL.

Aug. 29	1106.0	trace	34.650	40.360	740.	.014	.030	1.040	Clear; odorless.....
Sept. 5	1028.	"	35.280	23.015	750.	.002	.032	2.000	" " .....
12	892.	"	28.224	29.736	610.	.046	.056	1.125	" " .....
Mean..	1008.6	.....	32.718	31.037	700.	.0206	.0393	1.388	

## BREWER'S WELL—28 feet deep.

Sept. 12	899.	trace	11.592	79.650	624.	.010	.038	1.040	Clear; odorless.....
----------	------	-------	--------	--------	------	------	------	-------	----------------------

## LINCOLN SQUARE WELL—108 feet deep.

Sept. 12	420.8	trace	.....	9.204	380.	.474	.076	4.280	Clear; odorless.....
----------	-------	-------	-------	-------	------	------	------	-------	----------------------

## ST. NICHOLAS HOTEL HYDRANT.

Sept. 12	364.3	5.000	.....	6.018	320.	.056	.194	3.040	Clear; odorless.....
----------	-------	-------	-------	-------	------	------	------	-------	----------------------

## HOWELL'S WELL—30 feet deep.

Sept. 12	642.0	4.2	2.270	82.128	456.	.154	.076	1.280	Clear; odorless.....
----------	-------	-----	-------	--------	------	------	------	-------	----------------------

## SUNDRY ANALYSES.

In the following table analyses are given of waters from various towns and cities, of which, in most cases, but a single sample was received.

TABLE LXI.

Date. 1888.	Total Solids...	Suspended matter .....	Nitrogen in Nitrates.....	Chlorine.....	Hardness CaCO <sub>3</sub> .....	Free Ammonia	Alb. Ammonia	Oxygen con- sumed.....	Physical Conditions.
Marseilles, Aug. 31, spring .....	476.6	53.3	5.796	14.762	348.	.087	.172	3.200	Opalescent; peaty odor.
Monticello well Sept. 14.....	314.0	11.5	trace	3.186	248.	.006	.160	4.160	Clear; odorless .....
Ottawa well, Sept. 11.	1469.6	10.1	30.24	114.28	1320.	.032	.260	4.000	" " .....
Ottawa well, Oct. 1...	581.0	30.0	trace	124.90	426.	.652	.050	1.360	" " .....
Galesburg, Sept. 19, Dr. Foote's spring.	442.4	11.2	.00	3.77	336.	1.804	.128	2.400	Nearly clear; odorless..
Bunker Hill, Oct. 30, spring.....	704.8	3.3	.00	4.956	484.	.138	.026	1.040	Clear; odorless.....
Cairo, driven well, Oct. 2.....	662.2	65.5	.00	3.640	558.	1.084	.102	4.800	Yellow; turbid; odorless
Cairo well, Oct. 15 ..	658.8	15.5	.00	3.494	520.	1.086	.090	4.240	Yellow; turbid; earthy od'r
Elkville, well, Sept. 24	548.4	20.5	.00	1.295	318.	.060	.075	2.720	Nearly clear; odorless..
Elkville well, Nov. 3.	554.4	3.8	.00	1.180	280.	.013	.156	2.600	Clear; odorless.....
Elkhart, well, Nov. 10	598.0	6.6	22.76	3.894	400.	.060	.102	2.24	" " .....
Elkhart, well, Nov. 10	1030.8	16.6	.00	27.612	684.	1.250	.224	6.24	Slightly turbid; strong odor of sulphuretted hydrogen.....
Elgin, asylum, arte- sian well, Oct. 11...	312.8	2.0	.00	14.160	264.	.201	.092	16.88	Clear; organic odor.....
LaSalle, east spring, June 25. ....	342.6	....	1.14	2.650	316.	.114	.038	.920	Clear; odorless.....
LaSalle, west spring, June 25. ....	353.0	....	.63	1.440	328.	.....	.....	3.50	" " .....

The spring at Marseilles is situated in low ground between the canal and Illinois river, and not removed from danger of contamination by dwellings near.

The two well waters from Ottawa were sent because there existed good grounds for believing them contaminated by house drainage. The high nitrates and chlorides with albuminoid ammonia and oxygen consumption certainly confirm this suspicion regarding the first.

In the second case the free ammonia and chlorine are very suspicious.

The waters from the driven well at Cairo were yellow when received, and deposited iron compounds with organic matter on standing. The well is 56 feet deep.

The two samples from LaSalle came from large springs east of the city from which the household supply is now pumped. These springs are situated in the valley between the Illinois river and the canal, and are walled up and covered.

The test of the east spring shows a satisfactory freedom from organic matter. The amount of water received from the other spring was too small for complete tests.



XV

# THE ILLINOIS RIVER BASIN

IN ITS

## RELATIONS TO SANITARY ENGINEERING,

By L. E. COOLEY, C. E.

### PHYSICAL CONDITIONS.

To treat the hydrography of a river basin in a broad way, it is necessary to understand its geology,—the manner and method in which nature has disposed the rocks and fashioned the topography. As we appreciate the surface configuration, know the character of the superficial deposits, comprehend the stratigraphical arrangement of the underlying rock and its permeable or impermeable character,—as we understand the forces which have wrought all this,—we see why river basins, valleys and stream beds are fashioned as we find them; how watersheds, under similar climatic conditions, differ in the volume and character of the floods turned into the streams, and how the dry-weather flow varies in volume and persistence. As these things are understood, we may reach conclusions upon the ultimate effect of conditions wrought by inhabitation upon the flow of the streams draining the several watersheds. This is a matter of great economic and sanitary importance.

It is not proposed to present this matter fully at this time, but briefly such a resumé as will present an epitome of the conditions prevailing in the watershed of the Illinois river above the Copperas Creek dam.

If we take a general view of the stratigraphical arrangement of the underlying rocks of the State, the most pronounced feature is the anticlinal axis crossing the Illinois valley between Utica and La Salle,—perhaps the remnant of a mountain chain early denuded in geologic time,—extending in a general direction N. N. W. and S. S. E. Here are found the oldest rocks in the State, and the lowest horizon in the geological series, the Calcareous group of the Lower Silurian period.

This group outcrops upon the Rock river, in Ogle and Lee counties, and at the Falls of the Ohio, at Louisville. The lower magnesian limestone carries the water lime quarried at Utica and at Louisville, and above it lies the St. Peter's sandstone, extending along the Illinois from Utica to a point above Ottawa, from which the glass sand is derived.

In a general way, the rocks to the eastward of this axis succeed in regular series, The Trenton limestones lies to the north of the Illinois valley, then the Cincinnati group, (limestone with shaly partings,) crosses the Illinois valley in a belt some eight miles wide above Morris, and in which the bed of the lower Kankakee is situated. Both of these groups belong to the Lower Silurian.

Still above these in the series comes the Niagara limestone of the Upper Silurian, developed over a large extent of country in the northeast portion of the State, toward Lake Michigan. This rock underlies Chicago, extends down the Desplaines river to Channahon, and some of its beds are quarried at Lemont and Joliet.

There also lies, to the eastward of the axis and over this orderly succession, from above Ottawa to above Morris, the lower coal measures of the Carboniferous period, with some development to the north of the Illinois valley, but generally to the south-easterly.

As should be anticipated, the general dip of the rocks above described is at right angles to the axis of upheaval, or from La Salle toward Lake Michigan. There are endless variations in thickness, flexure, dip, etc., the characteristic disposition only being here set forth.

Some of these rocks are porous or water-bearing, as, notably, the St. Peter's limestone, from which the artesian supplies in the northeastern portion of the State are drawn. The Potsdam sandstone, lying on a still lower horizon, but not outcropping, is also tapped for water. Some springs are developed in the Cincinnati group, and also in some of the numerous strata of the coal measures.

So far as these strata outcrop, or are cut into by the beds of streams, they furnish springs and a uniform supply of water. So far as they constitute the immediate underlying rock, they absorb ultimately more or less of the rainfall, providing the superficial deposits are permeable. So far as the rocky strata are impermeable, they arrest the percolation of the water downward, and ultimately deliver it at some outcrop on a lower level. Aside from the permeable rocks, some of the limestones are jointed or fissured, through which the waters have dissolved channels of cavernous proportions. It is not known that any such conditions prevail in any of the strata of the northern portion of the State.

It is apparent that the general dip of the strata is in the wrong direction for a large supply of ground water to the Illinois valley. Had, for instance, the St. Peter's sandstone inclined in the proper manner, it might be furnishing a large supply of water from Lake Michigan to the valley. The manner, however, in which Lake Michigan was formed, determines the dip of the strata in that direction.

If we consider the strata to the southwesterly of the axis of upheaval, we find the later rocks occupying the larger proportion of the area of the State in a sort of trough, in a direction from the vicinity of Rock Island to the Wabash, the earlier rocks fringing the State upon the west, southwest and south, from above Burlington, upon the Mississippi, to near Shawneetown, upon the Ohio. In this geological basin or trough, the underlying rock is about half in the upper coal measures, all to the eastward of the Illinois, and about half in the lower coal measures.

The rim rock is of the Lower Carboniferous period, with some minor axes of upheaval, disclosing the older rocks as the Devonian at Rock Island, Devonian and Silurian in the vicinity of the mouth of the Illinois and below, and also in the southern end of the State.

As we gather these ideas, we can infer where ancient lakes, valleys and watersheds must have been, and where they would be now if the conditions had remained unchanged. The surface of the State and of the underlying rock has been profoundly modified, denuded, planed down and flexed, by the forces of at least two well ascertained epochs, called "drift" or "glacial," and the topography defined by the debris left in these periods. To a large extent, no doubt, the valleys were eroded or their locations determined before these periods, especially on the main lines, though the detail topography was formed at these times. The arterial valleys were, however, greatly modified. In one of these periods, the valley of the Mississippi, at Rock Island and at Keokuk, was filled up, and the modern channel is in a new location, over rapids which present forces are inadequate to plane down on the scale of the older valley. The Illinois valley in places was partially filled with drift or glacial deposits, and in some smaller streams the forces of erosion have not since been adequate to their removal.

What may be called the first drift or glacial period, extended southward nearly to the southern end of the State, and left deposits of clay with gravels and sands, the debris of all the northern rocks to Lake Superior and even farther, from a few feet to two or three hundred in depth. These are denuded in places, exposing the underlying rock, eroded in valleys, covered by lacustrine deposits; but in general they are the basis of soil throughout the glacial belt in northern latitudes. Rich in the proper mineral constituents, on the flat expanses of the original deposits flourished that active vegetable life which determined the uniform features and fertility of the prairies.

This drift is more or less modified, and to that extent the gravels and sands are stratified, or otherwise arranged by water action, so that they are waterbearing under present conditions.

The second and last glacial period is much better defined, and its action, though far more limited, was more characteristic. At least, it left those changes which are nearer our time, more directly related to modern problems, and of more immediate interest in the upper basin of the Illinois, with which we are immediately concerned.

Suppose that a great glacier, a sea of ice, filled the bed of Lake Michigan, several hundred feet in thickness above its present level, overlapping the present shore lines far inland, extending well down into Illinois, with its general axis in the direction of the lowest level or along the course of the Illinois valley, shoving, however, outwardly in all directions to lower levels, or as the resisting forces permitted; suppose that this glacier, in its greatest extension, reached the line dividing the waters of the Fox from Rock river, Bureau creek from Green river, crossing the Illinois valley at Putnam, and extending southeasterly along the general line separating the waters flowing northerly from those flowing to the Mackinaw and Sangamon, between the Iroquois and Big Vermilion, and between the Kankakee and Wabash in Indiana; suppose that this great glacial field, in its southward movement, brought the grindings, the washings and the debris of all the northerly rocks in its course, and deposited the material at its melting fringe; suppose that for a period of time the borders did not change—that the forces of advance, just balanced by the melting conditions of climate, deposited a great moranic ridge of debris, that there are periods of comparatively rapid recession and again periods of equilibrium, throwing down concentric ridges; suppose that the enormous volumes of water, pouring at first down the slopes of the outer ridge and excavating there the valleys, at a later period drained inside the ridge, between it and the ice fringe, to the main drainage or the Illinois—then you have a general picture of the last glacial period in Illinois.

A relief map of northern Illinois would show these concentric ridges, most widely separated along the axis of movement, and closing on each other in a common ridge as we go north into Wisconsin, or easterly into Indiana or Michigan. Between them lie the tributary valleys, the marginal lines of glacial drainage, all concentrating from the north and from the south and from the east the flow of waters in the Illinois Valley. Like inner lines of defense, the great ridges succeed each other with subsidiary ridges and traverses which define the minor basins. As we approach Lake Michigan, the last great ridge, or the present rim of the lake basin, crosses the old outlet above Lemont, in the township of Palos and Orland, going eastward, between the Calumet and Kankakee into Indiana and northward, as the west slope of the Desplaines watershed, into Wisconsin. In very recent times the Desplaines, like the Calumet, sent its waters to the lake, but alluvial deposits, probably assisted by the beaver, changed its flow in part down the old outlet valley.

During the last glacial period, the underlying rocks were generally denuded, though in places the drift of the preceding period, with its overlying soil and beds of humus, was left undisturbed. We should expect that the ridges would be largely as they were left, clay filled with boulders, gravel and sand, sometimes with irregular sand and gravel pockets; that their outer slopes should be steepest and their inner slopes gentle, and the valley of the stream close to the succeeding ridge; that the material should show more tendency to sorting or arrangement in beds of clay, gravel, etc., as the drainage line is approached; that there should be occasional ridge gaps, with plains of gravel and sand behind (like that at Plainfield, Will county, and of which Joliet Mound is a remnant below Joliet), where pent-up waters have poured out, leaving only the heavier material; that the summits of the ridges should be left with depressions in the mud axially at right angles to the ridge (the present lakes, ponds, marshes and bogs); that the underlying rocks should be scratched, ground and scored in the direction of the movement which the superficial deposits indicate, and that in these directions we should find the debris of the rock strata passed over. In all these things the expectation is fully verified.

A general ice cap covered the northern zones down to the international boundary, or below, and sent southward great tongues of glacial flow—one going out the head of Lake Superior, one out Green Bay, one out the bed of Lake Michigan, one out Saginaw Bay, which moved southward and lapped its debris with that of Lake Michigan in northern Indiana, and one out of Lake Erie toward the Wabash valley. Between these tongues are found no glacial deposits, no drift, the underlying rocks undisturbed, and the surface soil partaking of their character, fertile or otherwise, as in southern zones, rather than the uniform characteristics of the drift areas. Such driftless areas exist in northern Wisconsin, between the Superior and Green Bay tongues, and in southern Wisconsin and northern Illinois, between the Green Bay and Michigan tongues.

If, to this general conception of a northern ice cap with the limits stated, we add an ice cap at the southern pole no larger than now exists in arctic regions, we can see how such conditions would shift the centre of gravity of the earth sufficiently, how such masses would shift the waters northerly, so that an arm of the Gulf of Mexico would cover the site of Cairo and the southern part of the State.

Perhaps primitive man saw the last glacial period. The record is, however, upon the rocks, in the character and manner of the superficial deposits, in the configuration in northern latitudes. Toward this general conception the scientific mind has been crystallizing for fifty years, and only by some such interpretation is what we see and find understandable. The astronomical physicist interprets the endless variation and recurrence of planetary movement in cycles of time, tells when these periods have occurred in the past and when they will recur in the future. The scientific explorer studies the predominating antarctic ice cap, investigates ice action in the far north, follows the glacial flow in the gulches of the great mountain chains, and sees there occurring as though yesterday in time, that which has produced the profound results, and which we have endeavored briefly to portray.

As we gather these general conceptions, understand the forces which have acted in the underlying rocks, their character and dip, comprehend how the superficial deposits have been made, their nature, extent and configuration, the changes in level and flexure of the earth's crust, we appreciate how basins have been defined and valleys formed, what to expect in flood and low water and the tendency of the changing conditions wrought by man. All this must be understood to make intelligible the hydrography of a river basin.

As we understand the forces and mode of action in the last glacial period over the area reached by the Lake Michigan glacier, we can see how the north and south tributary watersheds of the upper Illinois river are all arranged in parallel series, even to the minor basins. We can understand how little of the rainfall can go down farther than the surface has been frost-heaved and dessicated by the vegetable growth of ages, how there is little stratified drift and gravel; how water courses were arranged by the water action of the past, to equalize the flow to the streams how the permeable rocks derive their supplies in remote regions and furnish in limited amount the water which was precipitated ages ago.

In some basins, notably the chalk of England, water reaches the streams almost wholly as ground water giving an equable flow at all seasons. The same is characteristic of the Greene river in Kentucky, and of all streams of equable flow. The upper Illinois is supplied almost wholly by surface drainage, and under such conditions, the variations with changing season and year by year are most pronounced and the superficial changes effected through inhabitation will be most potent.

The Illinois Valley, at least in its later stages, was excavated by the glacial drainage gathered in by its upper tributaries, the great volumes of water from the melting ice cap conducted hitherward along the line of glacial depression and carrying in large quantity the grit to grind and chisel away the resisting strata. As these strata vary, so do the characteristics of the valley eroded therein, in width, grade and general features.

The valley from above LaSalle to Beardstown is cut in lower coal measures, easily erodable, and is consequently wide, with a rocky floor at a considerable depth below the present surface of the bottoms. Below Beardstown Lower Carboniferous limestones continue to Columbiana, succeeded by Silurian rocks to the mouth, the strata less erodable,

the valley narrower and with more rugged escarpments. Throughout the whole 230 miles, the grade is very small, or such as is only due to an enormous volume of water carrying debris to remove by attrition.

Ascending from LaSalle, the waters and the debris were perhaps lessened in the glacial retreat, and when beyond the Chicago divide, clear water with less eroding force came. The valley is carved largely in the Silurian strata—more resisting than those encountered below—and the valley is narrow with heavier grades and precipitous descents.

Opposite Utica, the lower magnesian limestone carrying the water lime is developed, and the deep bed eroded in the coal measures below terminates abruptly. A steeper grade begins and is continued in the St. Peter's sandstone to two miles above Ottawa. Here the bed is again in the coal measures, a steep grade to Marseilles, or the chain of rocks near the mouth of the Kickapoo. Thence it is comparatively level and deep, the bed filled with debris, until the Cincinnati group of rocks is reached with a rocky bed to the streams, two or three miles above Morris. The limestone rock, however, at Marseilles is of limited thickness underlaid with fire clay, so the margin has been very narrow against a deeper erosion of this portion of the valley.

Crossing the Cincinnati limestone with some grade the Niagara limestone is met near the foot of Lake Joliet. Lake Joliet and Lake DuPage are simply two deep pools at the foot of steep slopes excavated by the great flow of glacial waters down the Des Plaines and DuPage valleys. Rising from Lake Joliet, there is a sharp slope in the resisting Niagara limestone of about eight feet per mile for ten miles to Romeo, thence a gentler grade to Walker's quarry, above Lemont, which is the summit of the rocky floor of the old channel and eight feet above low water in Lake Michigan.

Beyond this the general horizon of the rock deepens, its surface apparently irregular with superficial deposits of clay, hardpan, gravel and boulders, until in a few miles the rock dips well down under the site of Chicago. This description is also true in part of the Sag channel leading out through the Calumet region though the rock appears to lie at a greater elevation under the larger part of the Calumet district.

In the glacial retreat beyond the southern borders of Lake Michigan, the waters poured out by both of these channels, uniting above Lemont. All the ridges about the head of the lakes are benched and these levels can be traced for long distances, and some of them are characteristic, as showing where the waters stood for a considerable period of time.

At a level, 30 to 35 feet above present low lake, is a well defined beach line extending from Evanston around into Indiana, which must have marked the level of the lake for a long period of time, when the flow across the rocky floor of the old outlet could not have been less than 20 to 25 feet deep and the volume probably greater than the present Niagara. This was then the outlet of the three upper lakes, Superior, Huron and Michigan when the conditions which determine volume of water were not radically different from the present.

The circumstances which caused the abandonment of the old outlet, we will only allude to. The earth crust, relieved of the great ice weight, may have slowly risen until the flow was intercepted and the channel at Port Huron opened. It is supposed that the bed of Lake Michigan was fashioned in part by erosion and in part by the flexure of the crust under the ice weight. The Huron barrier, virtually a moranic deposit, may have given away through long and increasing percolation, and drained the lakes down below the level of the outlet. The indications are that the change was not prolonged over any considerable period of time but was measurably abrupt.

As the glacier retreated northward, the upper tributary valleys of the Illinois river uncovered and began to clear themselves of debris. The gradual retreat, the diminishing supply of water until it became measurably constant and the supply of debris, formed in the valley its own banks and flood plain—overflowed in summer—which now constitute the terrace, or second bottoms, traceable with some interruptions from Lake Joliet to the mouth of the river and furnishing the locations on which towns are built. The Hennepin bottom, the railway location from Bureau to Sparland, the site of Henry and the large fertile area behind it, Lacon, Pekin, Havana, Beardstown, all mark the level of

the old flood plain below LaSalle, from 30 to 40 feet above present low water and from 20 to 30 feet above the present bottoms, well above the highest waters of recent time.

These terraces mark the boundaries of the ancient stream flowing as the proper outlet of the three upper lakes with a volume greater, perhaps, than the present St. Lawrence. We have little information as to the depth below LaSalle, but from such examinations as have been made, a depth of 15 to 20 feet of mud and alluvium is passed through below the present low water before we strike the sands and gravels of the ancient stream bed. At Chillicothe, the gravel lies at 21 feet, and the rock floor of the valley at 36 feet below the level of the Copperas Creek pool.

The abandonment of the old outlet makes a radical change in conditions. A great stream bed, with its flow line well above present limits, carrying the waters in equable from a watershed of not less than 210,000 square miles flow—perhaps along with the gradually melting and retreating glacial accumulation of ages—is suddenly depleted and reduced to a local watershed of less than 12,000 square miles above Peru, with all its variations of flood and summer flow—such extreme variations as occur in a watershed almost wholly of surface drainage.

The local tributaries had become adjusted to the local drainage, had worked out their courses and grades in harmony with the conditions of water supply and the material of their beds. So the abandonment of the artery made no change except to steepen the grades in their lower reaches. But the great stream bed was not adapted to the changed conditions and must perforce shrink its dimensions and adjust its grade until the local volume of flow is in equilibrium with the forces of deposition—until from the spoils of the local drainage, the old stream bed is filled and reduced to present needs. This operation nature is now engaged in and will continue for ages until completed, unless man intervenes with a volume of water more uniform and in better harmony with the grade which now exists.

What is nature doing? Filling the old bed below LaSalle with alluvium, sand, ooze, steepening its grade, having already raised the bed of the stream from ten to fifteen feet above the old bed and filled in bottoms from 25 to 30 feet deep between the terraces or old banks. Every tributary is bringing its load and the main stream distributes the same or is choked thereby; yet the banks are only halfway up from low to high water while every alluvial stream in adjustment only tops its banks in extreme flood. Nature has a great task before it, a task longer than the perpetuity of nations, and meantime great areas of bottoms remain worse than useless, distilling disease.

Every upland stream carries its strip of higher ground across the bottoms, laying strips and patches to mark its former course which it may have abandoned to build up lower levels. Between are lakes, bayous, sloughs, marshes, a large proportion of the total area, flooded deep in high water, and building up with each year's light deposits; forbidding, unhealthy, stagnant, almost inaccessible reservoirs to feed the river in low water. Then there is the strip of higher ground along the river bank.

From Hennepin to Peoria, the tributaries are small, the total watershed very limited, and little detritus is carried across the bottoms to the main river. The valley filling is largely from the detritus of the upper river watershed which continually encroaches southward upon the remnant of the old stream represented by the broad and deep expanses from Chillicothe to Peoria. The large tributaries below have adjusted the conditions more nearly to their requirements, or the stream is in better harmony with its modern life below the Sangamon. But here backwater from the Mississippi complicates the flood conditions.

Above LaSalle, in the St. Peter's limestone, the modern stream has eroded a bed commensurate with present requirements. Still farther up, through the coal measures, and to the Cincinnati limestone, a stream bed has properly worked out, partly by erosion in the rock, and partly by raising the bottoms through deposition. The grades are ample to accomplish such results, and from the reef above the Marseilles dam to above Morris the excavated bed seems to be filled in part by heavy debris.

The Desplaines above Lake Joliet has cut no channel in the rock; it has barely cleared away the floatrock and defined its course for a depth of one to two feet, and its borders have not been raised by silt deposits,—evidence that this stream has flowed southward

for a short time,—but a few hundred years at most. The rocky floor from Joliet to Lemont is covered only with the thickness of a turf, and the “twelve-mile level” from above Lemont to Summit, with its alternation of pool, drift material and rock, is the remnant of the past. The silts of the Desplaines watershed have gone lakeward, deposited in the Mud Lake region, and partially dammed the flow in this direction. Had the Desplaines gone southward ever since the abandonment of the ancient outlet, it would ere this have grooved itself in the rock, built up its banks, and reduced the prism of Lake Joliet to present requirements.

Thus, from the disposition of the rocks, from the glacial action, we may infer how the basins have been formed and the valleys defined; from the character of the superficial deposits and the underlying strata, we may judge the flood and low water conditions, and the effect produced by inhabitation; from the functions of the ancient valley, we may diagnose the constitutional disorders produced by present conditions, and prescribe the remedy.

### EFFECT OF INHABITATION.

Inhabitation may produce profound changes in the flow of the streams which drain a local watershed or basin, and, within limits, modify the climatological conditions. The nature and extent of these changes, the effect of inhabitation, as already inferred, is dependent largely upon the superficial features, the distribution and character of the drift or glacial deposits, and the nature and disposition of the underlying rocks.

In a region of steep slopes and scant covering of impermeable rocks, wooded, the protected surface, the humus and debris, absorbs and retains the falling waters, distributes them more equably. Yet there comes a time when this capacity is exceeded, or when the surface may be frozen or impermeable, and also when a succession of dry seasons leaves no moisture, and the result is that the earliest records may show as great extremes of high and low water as the recent. After the clearing away of the forests, the slopes drain more readily and fully, the supply retained is less and sooner exhausted, and there recurs constantly those extremes of high and low water which were before phenomenal. The flow of water is more immediately dependent upon the meteorological conditions. The slopes, too, are more readily erodable, the streams become torrential, and their beds choked with the unusual supply of detritus, which of itself increases the apparent volume and extent of overflow.

If a similar region is underlaid with permeable strata, then the rainfall percolates downward, except when in great excess or, when the surface is frozen—a rare circumstance under such conditions. The streams receive a more equable supply, and may even continue after successive years of dry weather, from the supplies stored in the sub-strata. Under these circumstances inhabitation may not materially change the natural order.

In a flat region, or one of gentle slopes, with impermeable, subsoil the water collects in the depressions or moves slowly over the surface as a thin sheet. If the fall of water is moderate it may never reach the streams, but evaporates; if large, a great volume will accumulate upon the surface, to finally reach the watercourses in larger floods than ever come from any other class of watersheds. Unless the ground is frozen, it takes heavy precipitation to start the streams, and in dry weather the flow, of course, ceases. The surface gives up the little moisture it may contain cracks and is capable of receiving considerable water before it again flows away.

If, during the ages, a few feet of the surface have become permeable through the action of frost, drought and vegetation, a soil or mold is formed; the depressions filled with absorptive peat or humus, or remaining as ponds and lakelets, the action is modified. After a drought, it may take even more water to so saturate the surface as to make contributions to streams, the flood volumes will ordinarily be less and the flow more prolonged, and except under extreme conditions the flow from lakelets, ponds and bogs may not entirely cease. Such areas are not usually timbered. This condition would be further conservative and distributive of flow.

Inhabitation drains the natural reservoirs which have been furnishing a scanty volume to the streams in dry weather. It ditches the lands and increases their porosity so that the surplus water is more readily collected and more rapidly carried away; but

this is not all. The land, though more absorptive, does not have to become charged to the full capacity of the spaces between the particles, to overflow, as it were, but the waters percolate to the drains; the action is reservoir like, equalizing. The capacity to take rainfall is also greatly enhanced, and the precipitation must be rapid or frequent to overflow the ground for any length of time and to saturate it beyond a capacity for more in a brief time.

These conditions, with extreme precipitation or frozen ground, may not effect floods. After extreme drought, the flow will start sooner. In the ordinary case, the flow will come quicker, more gradually and last longer, but the result upon the stream will depend upon how far the reservoir action of the ditched lands will outweigh the destruction in large measure of the natural reservoirs. In any event the low water flow of the ordinary year is greatly lessened or wholly stopped, as the drained lands will not part with their moisture beyond a certain point, except through vegetation and ordinary evaporation. A diminution in the forest area, exaggerates the extremes, while its increase is conservative.

If we suppose the same general topography with shallow cut valleys, the substrata permeable, then the results will vary materially with the precipitation during the year, or during successive years. The tendency is to distribute results like permeable strata with steeper slopes, or with deeper cut drainage lines. The flow through permeable strata is necessarily slow, but is like flow everywhere, requiring grade to carry the water to some point of delivery. The general surface of this grade is called the ground water plane, and its height and slope vary with the supply of water, or with the season or year. Under the conditions of land stated, it lies necessarily close to the surface, so that heavy precipitation may cause the ground to be entirely filled, or to overflow, with flood conditions resembling those previously described, while the low water flow is well maintained. So from such surfaces, in wet years, heavy floods are to be expected, and again in other years, none at all. Inhabitation will drain such regions so as to lower or keep down the ground water plane, and to this extent may exaggerate flood conditions and diminish the supply for equable distribution without impairing the low water volume of the dryer years. Yet lowering the ground water plane leaves the ground above in a reservoir condition, so that the effect under some circumstances may be conservative as to flood exaggeration.

Such permeable grounds are usually more or less timbered. The clearing away exaggerates the surface drainage without any marked effect upon the low water volume of the streams.

The four general conditions discussed are typical. There are endless variations in the conditions of surface, configuration, subsoil, depth to rock and its character and disposition, the distribution of drainage lines, in different basins and even in the same watershed; differences in climatological conditions, in the amount and distribution of rainfall with the season, and with the years,—all factors in the flow from the watershed in wet and dry season, in flood and drought. As the flow of streams is studied, the hydrography of basin interpreted, all these things must be more or less appreciated and as the causes are apprehended the habits of the stream are understood.

As we understand the changes brought about by inhabitation in typical cases, we can apply the inferences to the condition that may prevail in any given basin, and thus reach results significant of the future. These may have a profound economic and sanitary importance and be well worthy of attention, with a view to correction or such provision as should precede rather than follow when necessity compels.

In general, it may be said, that the tilling of the surface, enables it to take the rainfall more readily, makes it more immediately absorptive than the prairie turf of centuries, often hard and compacted so as to shed the rainfall rapidly. At the same time, when the ground is saturated, the surface flow carries great quantities of material as silts to choke the stream bed or build up bottoms. This action is vastly exaggerated under the condition of frozen ground with melting snow, or the spring rains which settle the frost-heaved ground. So far then as inhabitation may exaggerate the floods, or decrease the low water, and with the vastly increased supply of detritus from the



tilled lands in any event, the streams themselves are placed under much more difficult conditions. In part, no doubt, recent popular ideas in regard to the change in the flow in streams are due to this fact.

It may also be stated generally that winter may begin with rains, a melting snow, to freeze quickly and close the surface against absorption, and that this condition will produce spring floods in any region when the accumulated snows are melted, often with drenching rains, leaving even the underlying soil devoid of moisture. Such a condition prevailed over a large portion of the upper Illinois basin in 1887. Heavy ice or snow water freshets, followed by a very dry soil and as little land-water in the Illinois river at Morris (in May) as known for thirty years. This probably came almost wholly from the natural surface reservoirs.

It is no doubt true that all these effects of inhabitation react upon the meteorological conditions—to what extent is a matter of speculation. It is the general belief, west of the Missouri river, that the rainfall is increasing (there seems to be little or no doubt of it), and this result has been ascribed to the tilling of the ground, the increasing porosity and absorbing power of the surface. Such effects, if occurring in Illinois, would be less noticeable with the greater precipitation in this State. It is difficult to believe that the profound meteorological causes can be materially changed, but the local cycle, subsidiary thereto, can no doubt alter in some degree.

Although the flow of local or tributary streams may be profoundly modified by inhabitation, this is true, in less degree, of the main stream or artery, the change being less with the area of basin considered.

The flood volume of a stream is never equal to the combined flood volumes of the tributaries, and with many tributaries and a large area, does not even approach such a volume. The several tributaries will not reach high water at the same time, nor will their floods reach the main stream conjointly; neither do they enter at the same point, but are distributed along the valley. The practical result is that the duration of the flood in the main stream is much lengthened, and the volume is correspondingly less than the aggregate of the tributaries. Alteration in the flood conditions of the tributaries will not materially change the time or order in the contribution to the main stream, and as the results are only partially cumulative the effect is relatively less. In many large basins no sensible change would probably occur.

The reverse is true, in a less degree, of the low water volumes. No two tributaries are in exactly the same condition as to low water at exactly the same time, but as the low water period is very much longer than that of floods, the results are more nearly cumulative. It is found, practically, that the low water volume in small basins is less per square mile than in large ones. Thus, the Mississippi at Grafton carries about four times the volume per square mile of its watershed as compared to the Illinois, though the conditions are not strictly similar.

Rains may not be uniformly distributed in any one year, nor in the same manner during the succeeding one; a considerable range in latitude may be covered, giving a very moderate and prolonged flood from the melting snow in streams running southerly, and cumulative results in those running northerly; basins may be differently shaped, thus collecting the waters rapidly and cumulatively, or slowly and distributively, a tributary basin may be subject to an extreme local flood, from extreme precipitation, which seldom exceeds the smaller areas at a given time. So from many causes, as the stream grows larger and drains a greater area, the extremes of low water and flood are relatively lessened, and the effects of inhabitation are less marked.

In all the results due to inhabitation, the detritus contributed to the main stream is greatly increased. The effect of this may be profound in a stream bed of little grade, and which, under previous conditions, had not yet adapted itself to its work. This, coupled with the diminished low water volume, has an important bearing upon the navigable utility of the stream in the future.

Under the previous head, the character of the upper Illinois watershed has been set forth—impermeable substrata, a good depth of permeable surface, flat or moderate slopes, with considerable bog, marsh and lake, and little timber, the main valley not adjusted to the drainage conditions below Utica. Inhabitation will increase floods, greatly reduce the minimum flow, multiply the amount of detritus. The tendencies will be destructive and most unhealthful in the lower valley. The conditions are presented more specifically, and in detail, later in this section of the report.

#### POPULATION DISTRIBUTION.

The project of supplying an additional volume of water to the Desplains and Illinois rivers from Lake Michigan at Chicago is of interest and great importance to the urban population of Cook county and to the population upon the watershed or basin of the Illinois river, or nearly two-thirds the population of the entire State of Illinois.

The area of the State is about 56,000 square miles.\* The area of the basin of the Illinois is 27,914 square miles, of which 4,110 square miles lie in the states of Wisconsin and Indiana. The area draining to Lake Michigan in Lake and Cook counties is 1,141 square miles, of which 450 square miles are in the basins of the Calumet rivers in Indiana.

The population of the State, of Cook county and of the State at large for 1850, 1860, 1870, 1880 and 1888, is given in the following table:

Date.	State.	Cook County.	State at Large.	Remarks.
1850.....	851,470	43,385	808,085	U. S. Census.....
1860.....	1,171,951	144,954	1,026,997	U. S. Census.....
1870.....	2,539,891	349,966	2,189,925	U. S. Census.....
1880.....	3,077,871	607,224	2,470,647	U. S. Census.....
1888.....	3,700,000	1,071,020	2,629,000	School Census.....

This table shows that the large increase in the growth of the State is in Cook county. The detailed exhibit given later shows it to be confined to about 250 square miles, or to Chicago and its immediate vicinity.

The population statistics are presented in two compilations, one pertaining to the basin of the Illinois river and the other to the basin draining to Lake Michigan. The latter gives various aggregate useful in considering the area and the population which may be served by a drainage channel to the Desplains and Illinois river: and, also, the probable growth of such areas or districts in the immediate future.

#### ILLINOIS RIVER WATERSHED.

The area of the Illinois river basin is 27,914 square miles. The population in 1880 was about 1,200,000, and the increase to 1888 about 70,000.

The compilation has been completed only down to the Copperas Creek dam, and is subject to revision. The area is 15,254 square miles, and the total population in 1880 was 679,273. The increase to 1888 was 43,475.

The following tables are made up from the United States census of 1880, giving the population of counties, and also of cities, towns and villages. They present the results in detail for each important tributary basin, and also for the aggregate area of the several basins. In compiling these results, all communities of over 5,000 population are classified as cities, those from 5,000 to 500 as towns, and those of 500 to 50 as villages, the remainder being rural. The tables are accompanied by such remarks as will serve to interpret their significance.

The changes to 1888 are computed from the county returns of the school census as reported by the State Superintendent. These returns are for the population under twenty-one years of age. The reports for Cook county and for the city of Chicago, give also the total population of those districts.

The State Superintendent estimates the total population of the State at 3,700,000, the number under twenty-one being 1,669,640. The population in Cook county is 1,071,020, the number under twenty-one being 446,953. The population in the State at large would be 2,629,000, and the number under twenty-one 1,222,687. The population would then be, outside of Cook county, 2.15 times the number under twenty-one years of age. This ratio is applied to the county returns in estimating the population for 1888.

The following table gives the population of counties situated wholly or in part upon the Illinois river watershed, down to the Copperas Creek dam, about 26 miles below Peoria bridge, or the foot of Peoria lake.

ILLINOIS RIVER WATERSHED COUNTIES.

County.	1880.	1888.	Change.	Remarks.
McHenry .....	24,914	24,308	-606	.....
Lake .....	21,239	21,283	-16	.....
Kane .....	44,956	52,761	+7,805	.....
DuPage .....	19,187	22,052	+2,865	.....
Cook .....	30,924	36,603	+5,679	{ All west of meridia of west boundary of Cicero, and including also the townships of Rich and Bloom.....
Will .....	53,431	61,746	+8,315	.....
Kankakee .....	25,050	28,208	+3,158	.....
Iroquois .....	35,457	34,660	-797	.....
Ford .....	15,105	16,358	+1,253	.....
Livingston .....	38,453	38,558	+105	.....
Grundy .....	16,738	21,689	+4,951	.....
Kendall .....	13,084	11,216	-1,868	.....
DeKalb .....	26,774	23,826	-2,948	.....
LaSalle .....	70,420	80,244	+9,824	.....
Bureau .....	33,189	33,587	+398	.....
Putnam .....	5,555	4,539	-1,016	.....
Marshall .....	15,036	13,556	-1,480	.....
Woodford .....	21,630	22,262	+632	.....
Peoria .....	55,427	60,236	+4,809	.....
Tazewell .....	29,679	29,442	-237	.....
McLean .....	60,115	62,963	+2,848	.....
Total .....	656,823	700,097	+43,274	.....

It will be noticed that those counties without large towns or cities, or mining industries, have decreased in population, while those counties containing large communities, or mines, have increased. Such cities as Joliet, Aurora, Streator, Bloomington and Peoria, have grown rapidly, far more so than indicated by the increase in population of the counties in which they are situated. The increase in Grundy county is due to coal mining. A large community has grown up at Spring Valley and vicinity, in Bureau county, but the balance of the county has considerably decreased. LaSalle county contains several cities which have grown more or less, as, likewise, Kane county. The portion of Cook county given has decreased largely, except in four townships, containing suburbs immediately west of Chicago. The same is also true of Du Page county.

In all these counties the decrease is assignable to special causes, and it is found that the urban increase is considerably in excess of the county increase,—in other words, that the centers of population have grown at the expense of the country. The rural population seems to have decreased quite generally,—from three to five to the square mile. In many cases, too, the villages and small towns appear to have decreased. Taking the normal growth of the country at large, the growth should not have been less than 25 per cent for the past eight years, or the increase in the counties tabulated should have been 164,000, instead of 43,475.

The absolute loss in growth in rural population is no doubt partially due to the remarkable growth of Chicago, but more largely to emigration to the new territory in the west, and it is probable that this movement will continue for twenty or thirty years, or until all the new lands are taken up, when the rural population will increase in density with a subdivision of farm areas. The change in distribution of population as between

rural and urban populations is doubtless due, in part to the increased application of machinery to agriculture, by which the necessary labor can be performed by fewer hands; in part to the rapid changes in transportation facilities, and in the methods of doing business, by which the needs of the county can be served from fewer and larger centers; in part to the increasing comforts of urban life, and the greater ease with which lands can be held and managed from the towns, and perhaps from that economic policy which has so greatly stimulated manufactures. The significant fact is the growing need of sanitary provision with urban increase, and the number of cities of large size which the Illinois river basin will contain. It is also worthy of note that Cook county contains one-half of the urban population of the State, as gathered in communities of sufficient size to require special sanitary consideration and provision.

In distributing the population between the several watersheds, after all attainable information is used, considerable judgment must be exercised, especially in regard to the increase during the past eight years. The results, however, as given by aggregates, can not be materially in error. In all cases, when not otherwise specified, the population in 1880 is intended.

The areas are computed from the large county atlas maps of Illinois, and from the State maps of Indiana and Wisconsin. The watershed line of the Desplaines above Lockport is from actual survey.

## KANKAKEE RIVER BASIN, 1880.

Basin.	Area.	CITIES.		TOWNS.		VILLAGES.		RURAL.		Total pop- ulation ..	Change in pop. 1888.	Counties.
		No.	Pop.	No.	Pop.	No.	Pop.	Per mile.	Pop.			
Iroquois....	2,000	..	.....	11	10,218	31	5,567	20	40,790	56,575	-1,124	Indiana, Iroquois, Ford, Kankakee, and Vermilion.....
Upper Kan- kakee.....	2,540	1	6,195	11	9,814	50	8,108	23	57,752	81,869	+3,131	Indiana, Iroquois, Kankakee and Will
Lower Kan- kakee.....	606	1	5,651	3	3,080	3	670	27	16,297	25,698	+2,302	Kankakee, Will, etc..
Totals ..	5,146	1	11,846	25	23,112	84	14,345	22½	114,839	164,142	+4,308	

The Iroquois and Kankakee basins in Indiana are as follows:

Designation.	Kankakee.		Iroquois.		Totals.	
Area—Square Miles.	2,212		828		3,040	
Cities .....	1	6,195	.....	.....	1	6,195
Towns.....	10	8,777	4	3,429	14	12,206
Villages .....	43	6,557	8	1,155	51	7,712
Rural .....	.....	49,278	.....	13,654	.....	62,932
Total population.....	.....	70,807	.....	18,238	.....	89,045

A large proportion of the Iroquois and Kankakee watersheds in Indiana is marshy, and with a sparse population. A considerable proportion of the headwaters of the Kankakee is in well populated territory, with some growing communities. Concerning the changes in population in the adjacent counties of Illinois and the character of the territory in Indiana, the population for 1888 is inferred. Considerable shifting of population has occurred from the country and villages to the larger towns and cities, and several stations on new railway lines have been established.

Below the great dam, just above Wilmington, the area is 220 square miles and the population, including Wilmington, 7,550, of which 5,500 is rural. Down to a point just above the city of Kankakee, 22 square miles and about 600 rural population should be added to the sum of the Iroquois and upper Kankakee basins. Down to Momence, the

Kankakee in Indiana should be increased by 130 square miles and 3,800 population, of which 654 are in three villages.

## DESPLAINES RIVER BASIN, 1880.

Basin.	Area	CITIES.		TOWNS.		VILLAGES.		RURAL.		Total population.	Change in pop., 1888.	Counties.
		No.	Pop.	No.	Pop.	No.	Pop.	Per mile.	Pop.			
Upper Desplaines...	342	..	.....	1	632	13	1,470	26	8,956	11,058	.....	Wisconsin, Lake Co.
To Summit...	292	..	.....	6	4,513	16	3,008	39	11,384	18,905	+5,152	Cook, DuPage.....
To Joliet...	176	..	.....	3	4,607	8	1,270	34	6,080	11,957	+2,488	Cook, DuPage, Will.
To L. Joliet.	130	1	11,657	1	524	3	526	33	4,340	17,047	+8,315	Cook, Will.....
To Ill. River	452	..	.....	5	5,507	11	2,546	31	14,137	22,190	+1,665	Will, DuPage.....
Total....	1,392	1	11,657	16	15,783	51	8,820	32	44,897	81,157	+17,620	

The basin includes the area tributary to the Illinois and Michigan Canal west of the range line through Summit and the Ogden-Wentworth dam.

The basin in Wisconsin is as follows:

Area, square miles .....	136.4
Villages, 6.....	810
Rural population.....	3,600

Total population..... 4,410

The population in Lake county has not materially changed in eight years, and it is assumed that the conditions are the same in Wisconsin, so the total population in the upper Desplaines show no increase. If there is any change, it is in the growth of urban population at the expense of the rural districts.

The purely rural districts of Cook county have decreased. The townships of Maine, Leyden, Proviso, and the north tier of sections in Lyons contain suburbs of Chicago and show an increase. Suburbs in DuPage also give an increase. The net increase in the basin from Lake county to Summit, is 5,152.

From Summit to Joliet the increase is almost wholly at Lemont, with some additions from suburbs in DuPage county.

The increase in the basin to Lake Joliet is assumed at that for Will county. It is known, however, that Joliet has doubled in population, or the increase is greater than assumed.

The increase in the DuPage basin is due to Chicago suburbs, and is assumed as the entire increase to the Illinois river, the junction with the Kankakee.

The DuPage river basin is as follows:

Area, square miles.....	366
Towns, 5.....	5,507
Villages, 10.....	2,234
Rural population.....	11,409

Total population..... 19,190

Increase in 1888..... 1,665

## FOX RIVER BASIN, 1880.

Basin.	Area.	CITIES.		TOWNS.		VILLAGES.		RURAL.		Total population.	Change in pop., 1888.	Counties.
		No.	Pop.	No.	Pop.	No.	Pop.	Per sq. mile.	Pop.			
Wisconsin..	932	..	.....	6	10,381	28	4,155	32	29,746	44,282	.....	State of Wisconsin..
To Elgin...	610	..	.....	4	4,530	22	4,623	26½	16,186	25,139	-1,190	M'Henry, Lake, Kane, Cook.....
To Aurora..	200	1	8,789	3	5,415	6	1,062	32	6,460	21,726	+3,832	Kane, Cook, DuPage.
To Millington	420	1	11,875	1	2,448	14	3,507	25	10,616	28,446	+3,036	Kane, DuPage, Kendall, DeKalb.....
To Ill. River	538	..	.....	4	5,059	8	1,417	27	14,637	21,113	-600	LaSalle, Lee, DeKalb
Totals ..	2,700	2	20,664	18	27,633	78	14,764	28¾	77,645	140,706	+5,078	

The population of 1888 in counties bordering Wisconsin does not indicate any material change since 1880 of the population of the basin in Wisconsin.

Aurora, Elgin and Batavia have about doubled in population and Geneva and other towns have notably increased. The rural population has decreased. The net results are shown in the table. The change in the aggregate is less than four per cent.

The statistics for the basin in Wisconsin are given in the first line of the above table.

ILLINOIS RIVER BASIN, 1880.  
(Omitting the Desplaines, Kankakee and Fox.)

Basin.	Area.	CITIES.		TOWNS.		VILLAGES.		RURAL.		Total population.	Change in pop., 1888 ..	Counties.
		No.	Pop.	No.	Pop.	No.	Pop.	Per sq. mile.	Pop.			
AuxSable to Morris ....	218	..	.....	..	.....	4	891	25	5,523	6,414	-900	Will, Kendall, Grundy
Mazon to Morris ....	540	1	5,524	4	3,557	9	1,688	26	14,093	24,862	+4,846	Grundy, Livingston, Will, Kankakee ....
To Marseilles	202	..	.....	2	4,224	..	.....	26	5,326	9,550	+200	Grundy, LaSalle ....
To Fox Riv.	31	..	.....	1	1,882	..	.....	27	838	2,720	+400	LaSalle .....
Below Utica	136	1	7,834	1	767	1	135	27	3,674	12,410	+4,000	LaSalle .....
L. Vermilion R. to Peru	165	1	7,847	1	4,142	2	380	27	4,451	16,820	+2,000	LaSalle. ....
Vermilion R. to Peru ...	1,317	1	5,157	5	7,005	25	4,564	26	33,987	50,713	+2,264	LaSalle, Livingston, McLean, etc .....
Total....	2,609	4	26,362	14	21,577	41	7,658	26	67,892	123,489	12,810	

The population in the mining districts and in the larger towns and cities is greater than the table indicates, as the rural population has sensibly decreased. Streator has grown notably. Ottawa has also grown considerably. The mining districts in Grundy and adjacent counties have increased notably. Considering all these matters the net change is estimated as given in the table. The total increase is about ten per cent.

The Vermilion basin above Streator gives quantities approximately as follows:

Area, square miles.....	1,105
Villages, 21.....	4,155
Towns, 4.....	6,501
Rural .....	28,090

Total population..... 38,746

No material change is noted for 1888.

ILLINOIS RIVER BASIN, 1880.  
(LaSalle to Copperas Creek Dam.)

Basin.	Area.	CITIES.		TOWNS.		VILLAGES.		RURAL.		Total population.	Change in pop., 1888.	Counties.
		No.	Pop.	No.	Pop.	No.	Pop.	Per sq. mile.	Pop.			
To Hennepin.....	162	1	5,057	..	.....	3	683	26	4,241	9,981	+4,584	La Salle, Putnam, Bureau.....
To Bureau Creek.....	480	..	.....	3	4,929	11	2,805	27	12,840	20,574	-1,880	Bureau, Lee.....
To Henry dam.....	300	..	.....	2	1,534	5	1,431	24	7,169	10,134	-1,240	La Salle, Putnam, Marshall, Bureau...
To Chilli-cothe.....	446	..	.....	3	5,455	9	1,640	24	10,869	17,964	-1,430	Marshall, Wood ord, Putnam, Bureau...
To foot of Peoria Lk	244	..	.....	2	2,333	7	1,051	22	5,306	8,690	-587	Woodford, Peoria, Tazewell, etc.....
To Pekin...	352	1	29,259	3	3,441	6	778	32	11,363	44,841	+5,000	Tazewell, Knox, Peoria.....
To Copperas Creek dam	206	..	.....	..	.....	7	898	32	6,568	7,466	-600	Peoria, Fulton.....
Mac k in a w R. to dam.	1,217	1	5,998	5	5,257	22	4,475	28	34,399	50,129	-188	Tazewell, McLean, Woodford, etc.....
Total.....	3,407	3	40,311	18	22,949	70	13,761	27	92,755	169,779	-3,659	

A general increase in towns and cities and a decrease in rural population has occurred. The principal increase is in Spring Creek valley, a mining district of Bureau county, and in the city of Peoria.

The following general table gives the aggregate results for the entire basin down to Copperas Creek dam.

The aggregate basin of the Illinois in Indiana and Wisconsin is as follows:

Total area, square miles.....	4,110
1 city .....	6,195
20 towns.....	22,587
85 villages.....	12,677
Rural .....	96,278

Total population..... 137,737

These quantities, taken from the aggregate of the table, give the statistics as to the basin within the State of Illinois.

#### ILLINOIS RIVER BASIN. (Recapitulation.)

Basin.	Area.	CITIES.		TOWNS.		VIL- LAGES.		RURAL.		Total popu- lation.....	Increase, 1888 .....	Remarks.
		No....	Pop.	No....	Pop.	No....	Pop.	No. pt. sq. m.	Pop.			
Desplaines .	810	..	.....	10	9,752	37	5,748	32	26,420	41,920	7,640	To Joliet.....
Desplaines.	1,392	1	11,657	16	15,783	51	8,820	32	44,897	81,157	17,620	To Kankakee River
Kankakee R.	6,538	3	23,503	41	38,895	135	23,165	24½	159,736	245,299	21,928	To Illinois River...
Illinois Riv.	7,529	4	29,027	48	48,558	148	25,744	24½	185,516	288,845	26,474	To Ottawa .....
Fox River ..	10,229	6	49,691	66	76,191	226	40,508	25½	263,161	429,551	31,552	To Ottawa .....
Illinois Riv.	11,847	9	70,529	73	88,105	254	45,587	26½	305,273	509,494	39,816	To Peru., .....
Illinois Riv.	12,789	10	75,586	78	94,568	273	50,506	25¾	329,523	550,183	41,280	To Henry .....
Illinois Riv.	13,479	10	75,586	83	102,356	289	53,197	25½	345,698	576,837	39,263	To Peoria .....
Illinois Riv.	15,254	12	110,843	91	111,054	324	59,348	26	398,028	679,273	43,475	To Copperas Creek

It will be noticed that over one-half the increase in population is in cities and towns upon the Fox and Desplaines, and within a comparatively short distance of Chicago.

The increase in urban population in cities and towns is probably double the aggregate increase given for the total basin.

The urban population in 1880 was about 40 per cent of the total population. At the present time it appears to be about 50 per cent.

#### LAKE MICHIGAN WATERSHED.

The 16 townships of Cook county already tabulated,—all west of range line through Summit and west boundary of Cicero, and also Rich and Bloom,—have an area of 547 miles, with a population of 30,924 in 1880, and 36,603 in 1888. If Thornton, Bremen, the west four tier sections in Worth, and New Trier, be added, it will include all of Cook county outside what is usually called the Metropolitan area, a total area of 669 square miles with a population of 38,670 in 1880 and of 46,354 in 1888. The Metropolitan area includes 270 square miles, and a population of 568,854 in 1880, and of 1,024,643 in 1888.

The area draining into Lake Michigan is in two basins, the Chicago river, extending into Lake county, and the Calumet, reaching with its branches into Will county and into Indiana.

The area draining into the Chicago river north and west of the Metropolitan area is 87½ miles, including a population of 3456 (two villages of 285 population included), from and the Metropolitan area 202 miles with a population of 559,408 a total area of 289½ miles with a population of 562,864. In 1888 the population had increased 415,830 in the Metropolitan area and diminished 185 outside, a total increase of 415,645, and a total population of 978,509.

The area draining to the lake direct, north of the Metropolitan area, in Cook and Lake counties, is 63 miles, with a population as follows:

Towns, 4 .....	6,648
Villages, 3 .....	950
Rural .....	2,306
Total population .....	9,904

This had increased 1297 in 1888, and the total population was 11,201.

The area outside the Metropolitan district, in Cook and Will counties, and tributary to the Calumet, is 270 square miles with a population as follows:

Towns, 2 .....	1,042
Villages, 10.....	2,488
Rural.....	8,912
Total population.....	12,442

This had increased 497 in 1888.

The Grand Calumet in Indiana is included in the summary of the Calumet river. Its drainage is uncertain, but, under usual circumstances, into Illinois. The total area is 450 square miles with a population as follows:

Towns, 4.....	7,420
Villages, 18.....	3,178
Rural.....	10,069
Total population.....	20,667

The increase to 1888 is probably immaterial.

The Metropolitan area draining to the Calumet is 68 square miles, with a population of 9446 in 1880, increased to 49,405 in 1888.

The total Calumet basin is 788 miles, with a population of 42,555 in 1880, and of 83,011 in 1888.

The total area going to the lake from the Illinois frontage is 1141 miles. The total population was 615,323 in 1880, and 1,072,721 in 1888.

The metropolitan district has a length from north to south of 28½ miles, and an extreme width of 13½ miles, the area being 270 square miles. The population in 1880, 1886 and in 1888, and in Cook county at large, is as follows:

Designation.	Area.	1860	1870	1880	1886	1888
Metropolitan.....	270	121,949	319,640	568,854	878,057	1,024,643
County at large..	669	25,005	50,326	38,670	39,345	46,377
Cook county ....	939	144,954	349,966	607,524	917,402	1,071,020

The population outside the Metropolitan area which pertains to Chicago, or is purely suburban, will make the total city and suburban population equal to 1,039,000.

The population on the Metropolitan area in 1888 was distributed as follows: The statistics are given by congressional townships, as in school census, except where they overlap the city.

#### METROPOLITAN DISTRICT.

Designation.	Area.	Population.	Remarks.
Niles.....	23	2,850	.....
Evanston.....	10	11,485	.....
Jefferson.....	35	11,409	Omitting sec. 36, annexed to Chicago
Lake View.....	11	42,339	.....
Cicero.....	25	13,926	.....
Lyons and Lake.....	36	1,907	.....
Lake and Hyde Park.....	35	97,671	To 87th street.....
Worth.....	12	2,340	Two east tier of sections .....
Calumet and Hyde Park.....	36	22,617	.....
South Chicago.....	10	15,448	.....
Outside Chicago .....	233	221,992	.....
Chicago .....	37	802,651	Including sec. 36, Jefferson .....
Total.....	270	1,024,643	.....



If a district bounded by two miles north of city limits, the west boundary of city extended north and south and three miles south of city limits, be taken, it will have an area of 69 square miles and a population as follows:

North of city limits.....	43,347	
South of city limits.....	81,728	
Chicago .....		125,075
		802,651
Total.....		927,726

The greater proportion of the population outside the city limits is on the adjacent 32 miles north and south, and the growth is more strongly in these directions than to the west.

If a sanitary district be assumed so as to conform to political boundaries so far as the watershed will permit, it may be delimited as follows: North, one mile south of Evanston and Niles; west, along range line west of Jefferson and Cicero to south line of Lyons; south, along south line of Lyons and Lake to one mile east of Western ave., then northeasterly to Jackson Park. The area of such a district is 161 square miles, of which 52 square miles are sewerred.

The population of this district in 1888 was 959,300. The district north had 15,935 on 41 square miles. The Calumet district had 49,405 on 68 square miles.

The population of the district in 1886 was approximately 824,000. In 1880, it was 549,200, the district north having 10,200 and the district south 9,450. The population in the sanitary district was 310,177 in 1870, and 117,442 in 1860.

Should the district be extended down the Desplaines to the boundary of Lyons, about 23 square miles additional may be included and about 1,200 population in 1888.

The population in the Sanitary district is distributed approximately as follows:

	1886.	1880.	Remarks.
Tributary to lake, practically all sewerred.....	86,000	17,000	
Sewerred to Chicago river and branches.....	697,000	800,000	
Tributary to river, but unsewerred.....	41,000	42,300	
Total population.....	824,000	959,300	
North of Madison street .....	322,500	400,000	Sewerred.

There is some sewerage in Cicero, tributary to the Ogden-Wentworth ditch and thus to the river system, which is not considered in the above.

All the population tributary to Chicago river and branches is also tributary to the Illinois and Michigan Canal, by means of the circulation occasioned in the North Branch by the Fullerton avenue conduit, whereby its contents are discharged into the South Branch and, with the sewage of the South Branch, carried to the canal by means of the circulation induced by the pumping works at Bridgeport. There is a small population tributary to the North Branch above Fullerton ave., but there is little sewage as yet from this source. This is moved down by the land water which is very little at low water. The population tributary to the South Fork was 75,000 in 1886. This has increased somewhat in 1888. This fork has only the circulation due to storm water and the water supply. Little sewage enters to the West Fork and this is sufficiently circulated at present by the water through the Ogden-Wentworth ditch.

The estimates of population north of Madison street bridge are useful in interpreting the condition of the river at that point.

Other sanitary districts are feasible in Cook county. The Calumet basin is a natural district which may be sewerred by a channel drawing water from the lake and passing through the Sag to a junction with the Desplaines channel. An Evanston district on the north is possible, also drawing water from the lake and tributary to a Chicago channel. The Desplaines river basin immediately above Summit is an additional district which can be drained in a different manner. Growth of population will, in time, demand proper provis'on in all these districts.

## POPULATION INCREASE.

The indications are all that the rural or country population is decreasing, the increase being confined to the larger communities and the mining districts. The aggregate increase in the State outside of Cook county is small, some 159,000, when it should be about four times as great. Even including Cook county with its great growth, the aggregate increase for the entire State is still nearly 200,000 short of the normal increase for the whole country.

The causes which may be assigned for this condition have been already discussed. It does not seem probable that the growth will become normal for twenty or thirty years or until the arable lands in the territories and new states are occupied, if the present economic conditions are to continue.

If the present population of the metropolitan area be taken at 1,025,000, the increase in two years has been 147,000, and for eight years 456,000. The probable population for 1890 may be assumed at 1,175,000, an increase of 606,000 in ten years, or greater than the population of 1880.

The population of the sanitary district assumed has increased 410,000 in eight years, and 135,000 in two years. The population in 1888 was 959,000, and the prospective population in 1890 is 1,090,000.

The population of the city has increased 300,000 in eight years, and 100,000 in two years, including 10,000 annexed since 1886. The probable population on the present city area is 890,000 in 1890.

The population of Cook county was 1,071,000 in 1888, a growth of 464,000 in eight years, and of 154,000 in two years. The probable population in 1890 may be assumed at 1,230,000, or more than double that of 1880.

If an increase of 200,000 be assumed for the State outside of Cook county, or 2,670,000 in 1890, the total population will be 3,900,000, of which Cook county will contain 31½ per cent. In 1900 Cook county will contain about 40 per cent of the total population of the State. After that the relative increase will probably be slower, and it is doubtful if Cook county ever reaches 50 per cent. of the State.

In considering the growth of population, the entire community should be taken to ascertain the normal rate. The growth on any given part of a metropolitan area is apt to be spasmodic for any rapid increase or boom in a given direction is soon arrested by rapid appreciation of property or other causes. Taking communities as a whole, their growth by decades is remarkably steady after they reach a certain stage.

If the community centered around New York be taken, the growth has not varied materially since 1840, from 470,000 per decade; Philadelphia, except for the civil war, 180,000; Boston, 100,000, and St. Louis, about the same as Boston since 1850. These increments show a tendency to some increase for this decade. These results indicate that an increment does not diminish after a certain period of growth, or a community has obtained its majority. There is no reason, therefore, to suppose that Chicago will ever diminish its rate of 600,000 per decade, having attained that rate in the present decade. If the rate for the last two years be taken, the decennial increase will be at the rate of 750,000.

In the growth of cities, however, the decennial constant is approached gradually. The past growth of Chicago as yet shows no tendency to constancy, as the past three decades have been 200,000, 250,000 and 600,000 respectively. The great fire probably reduced the increase 1870-80 by 150,000. Although in the periods before a constant rate is attained irregularity is often noticeable, still the indications are that Chicago will continue to increase its rate for some time to come.

The statistics of population for the last five two-year periods when reduced to a normal rate, show that the increment is increased 15,000 each two years; in other words, that the increment of 90,000 for 1880-82 has increased to 150,000 for 1888-90. The last

column of the following table gives the future population by this rule, while the first two columns give the constant rate as in the older cities, the first at 600,000 per decade and the second at 750,000. The figures indicate the population in thousands.

METROPOLITAN AREA.

Year.	Increment 600,000 per decade.	Increment 750,000 per decade.	Normal Growth.
1890.....	1,175	1,175	1,175
1892.....	1,295	1,325	1,340
1894.....	1,415	1,475	1,520
1896.....	1,535	1,625	1,715
1898.....	1,655	1,775	1,925
1900.....	1,775	1,925	2,150
1902.....	1,895	2,075	2,390
1904.....	2,015	2,225	2,645
1906.....	2,135	2,375	2,915
1908.....	2,255	2,525	3,200
1910.....	2,375	2,675	3,500
3,000,000 in.....	1,920	1,915	1,907

If the causes of Chicago's rapid growth are fully considered there is no reason apparent why it should not continue somewhat as in the last column until a population of three million or more is attained. Then she should continue to grow with the increasing density of the country at the normal rate of 30 to 33 per cent. per decade, or at 25 per cent. if emigration ceases. This means that the decennial increment is not likely to be arrested short of one million for each ten years. If this be the case, Chicago will overtake the New York community in 20 to 25 years, and in time become the biggest city of the world. The great and resourceful area tributary to Chicago makes all this possible, and if proper statesmanship directs her energies it is rendered probable. It is simply the problem of maintaining the healthiest and cheapest city in which and from which to do business.

TRIBUTARY BASINS AND STREAMS—GENERAL SUMMARY.

The Illinois river is formed by the junction of the Desplaines and Kankakee rivers, 9½ miles above Morris, the northern tributary heading in Wisconsin and the eastern heading in Indiana, the two enclosing the head of Lake Michigan like the branches of the letter Y. The junction is 51.3 miles from Lake Michigan by the general course of the Desplaines river and the nearest route therefrom across the land to the lake.

The following table gives the areas of the several tributary watersheds and the points at which their streams join the Illinois. These areas are computed from the county atlas maps of the State and the state maps of Wisconsin and Indiana. They include also the river front proper to the points designated. The distances are taken from the city and U. S. surveys, and are computed from the head of the Illinois. The bank is right or left going down the stream and is indicated by R. B. or L. B.

## AREAS OF BASINS.

Tributary.	Area.	Total area.	Distance miles.	Bank.	Area To.
Desplaines River .....	1,392	.....	00.0	R. B.	} Junction of Rivers
Kankakee River .....	5,146	6,538	00.0	L. B.	
Aux Sable River .....	218	6,756	4.7	R. B.	Morris.....
Mazon River .....	540	7,296	9.7	L. B.	
Nettle Creek, etc .....	63	7,359	10.0	R. B.	Seneca.....
Waupecan Creek and Hog Run..	70	7,429	12.1	L. B.	Marseilles.....
Kickapoo Creek.....	45	7,474	22.7	R. B.	
South Kickapoo Creek.....	24	7,498	23.7	L. B.	Ottawa .....
To Mouth Fox River.....	16	7,514	33.1	R. B.	
To Mouth Fox River.....	15	7,529	33.1	L. B.	" .....
Fox River.....	2,700	10,229	33.1	R. B.	
Covel Creek.....	100	10,329	36.4	L. B.	Utica.....
Clark's Run .....	36	10,365	42.5	R. B.	Peru.....
Vermilion River .....	1,317	11,682	46.2	L. B.	
Pecumsaugan C'k, L. Vermilion R.	165	11,847	47.1	R. B.	" .....
Spring Creek.....	56	11,903	52.9	R. B.	
Negro Creek.....	34	11,937	57.3	R. B.	Hennepin.....
All Fork.....	72	12,009	.....	L. B.	
Bureau Creek.....	480	12,489	62.9	R. B.	" .....
Coffee Creek.....	24	12,513	65.8	L. B.	
Clear Creek.....	52	12,565	71.7	L. B.	Henry.....
Senachewine Creek.....	77	12,642	73.8	R. B.	
Sandy Creek.....	147	12,789	75.7	L. B.	" .....
Crow Creek, (west).....	88	12,877	81.0	R. B.	
Crow Creek, (east).....	226	13,103	89.6	L. B.	Chillicothe.....
Senachewine Creek.....	132	13,235	90.4	R. B.	Peoria.....
Richland Creek, etc.....	198	13,433	93.8	L. B.	
West Slope.....	46	13,479	.....	R. B.	Pekin.....
Kickapoo Creek.....	310	13,789	112.1	R. B.	
Luck Creek.....	42	13,831	114.9	L. B.	Copperas Creek Dam
Mackinaw River .....	1,217	15,048	121.0	L. B.	
Tamarish Creek.....	55	15,103	.....	R. B.	Kingston.....
Copperas Creek.....	151	15,254	134.0	R. B.	Copperas Creek Dam
Duck Creek, etc .....	110	15,364	138.1	R. B.	Havana.....
Quiver River .....	220	15,584	149.9	L. B.	" .....
Spoon River .....	1,870	17,454	151.6	R. B.	
Otter and Wilson Creeks.....	140	17,594	160.7	R. B.	Beardstown.....
Sangamon River .....	5,670	23,264	174.1	L. B.	
Sugar Creek.....	180	23,444	177.7	R. B.	LaGrange Dam.....
Crooked Creek.....	1,385	24,829	188.3	R. B.	
Indian Creek.....	290	25,119	193.4	L. B.	Griggsville Landing
McKees River.....	472	25,591	205.7	R. B.	
Mauvais Terres Creek .....	275	25,866	209.2	L. B.	Montezuma.....
West Slope.....	75	25,941	.....	R. B.	
Big Sandy, etc .....	190	26,131	220.7	L. B.	Kampsville Dam .....
West Slope.....	75	26,206	.....	R. B.	
Apple Creek, etc .....	525	26,731	235.7	L. B.	" .....
West Slope to Macoupin Creek..	45	26,776	.....	R. B.	
Macoupin Creek.....	985	27,761	248.6	L. B.	" .....
Otter Creek.....	85	27,846	256.4	L. B.	
West Slope.....	40	27,886	.....	R. B.	} Mouth at Camden.
East Slope .....	28	27,914	.....	L. R.	

It will be noticed that thirteen tributaries, each exceeding four hundred miles in area, carry 23,699 miles or 83 per cent. of the drainage, and that the direct drainage to the Illinois is small. The Illinois basin is really a series of basins rather than a homogeneous whole.

Above Peru, about 94 per cent. of the area lies in five basins. From Peru to Copperas Creek Dam, Bureau Creek and Mackinaw River carry about half the area of 3,407 miles. From Copperas Creek Dam to LaGrange Dam, Spoon River, Sangamon River and Crooked Creek add 8,925 out of 9,865 miles. Below LaGrange, three tributaries carry over 70 per cent of the area.

If the lower Illinois be divided into three nearly equal divisions, the tributary drainage to the middle division is almost exactly the same as the total watershed above Peru, and over two-thirds of that below Peru. The other two divisions receive but 17 per cent of the total watershed, and only 30 per cent of that of the lower river.

The upper third of the lower Illinois is then practically under the drainage conditions of the upper basin, while the lower third is modified by the equal central basin, which

virtually extends across the State. Aside from these two main basins, the remainder of the watershed is largely direct shore or slope drainage.

In all studies of the Illinois river proper, these characteristics must be considered, as also the influence on floods, in the lower division, of the backwater from the Mississippi river.

### THE DESPLAINES WATERSHED.

The Desplaines unites with the Kankakee just east of the west boundary of Grundy county, to form the Illinois. It drains an area of 1392 square miles; almost wholly within the counties of Will, DuPage, Cook and Lake, and in Kenosha county, Wisconsin.

The general direction of the basin is north and south, with a length of 90 miles, and a greatest width from east to west of about 25 miles. The watershed contains three characteristic or true basins,—the Desplaines proper, Salt Creek, and the DuPage river. In a strictly topographical sense, however, the Desplaines basin does not extend farther south than the great boundary ridge of the lake basin, which crosses the old outlet in the vicinity of Willow Springs, or this basin is within the rim of the lake watershed. Normally, therefore, the drainage south of Willow Springs pertains to the outer slope of the main ridge, and to this class belong the considerable areas drained by Hickory and Jackson creeks. The Salt Creek basin normally extends southward nearly to Willow Springs, between the ridges now drained to Flag Creek, but the stream broke through a gap north of Western Springs, and now crosses the slope of the Desplaines basin to Riverside.

Considering the manner in which the surface configuration of this portion of the State has been formed,—a series of troughs left between morainic ridges by the retreating glacier,—the topography is better understood. The several minor watersheds would then be depressions between the ridges, gradually closing, running out to the northward in a general flat ridge, as the theory indicates. Thus, there is the ridge which limits the Desplaines watershed at Dresden, opposite the mouth of the Kankakee, extending northward and uniting with the main ridge to enclose the DuPage watershed, a second ridge uniting northward and defining the Salt Creek watershed, and finally, the eastern ridge of the Desplaines watershed, which, however, does not close upon the headwaters of the Desplaines, a summit slough draining northward, as well as southward, to Root river, which empties into Lake Michigan at Racine.

This general series of ridges closing or uniting northward is characteristic, and is illustrated in the divisions of the headwaters of the Chicago river and in the lake ridge now undergoing erosion, from Winnetka northward, uniting with the east ridge of the Desplaines watershed west of Waukegan.

All these ridges terminate to the south, are virtually cut across by the old outlet channel which drained these troughs and the glacial waters, afterward the three upper lakes from the bay which covered the site of Chicago, down what is now called the Desplaines valley below Summit.

The mother rock underlying the whole of the Desplaines watershed, except its extreme lower end, is the Niagara limestone. The Cincinnati group extends up the Desplaines and DuPage rivers five or six miles from the mouth. The watershed is then underlaid with impermeable rock, except a very limited portion of the southern end which carries some water, the Cincinnati group and possibly the lower strata of the Niagara, if of the same horizon as the rock underlying the clay beneath Chicago from which considerable supplies are obtained.

These ridges and intermediate deposits overly the rock from 20 to 100 feet in thickness, and, as was to be expected, are in the main unstratified as they were left by the retreating glacier, though a greater tendency to stratification is exhibited as the streams in the lowest levels are approached. As the great main channel is approached, the tendency to stratification is more pronounced; beach, terrace and gravel deposits occur, the latter behind gaps in the ridges, as at Plainfield, where the escaping waters left only the heavier material. As a whole, however, the portion of the Desplaines watershed which

contains formations which will absorb any considerable proportion of the rainfall and deliver it equably to the streams as ground water, is very limited and confined for the most part to the lower end of the watershed.

The action of the original forces would leave the surface of the slopes in folds or rolls, the tops of the ridges in knobs and depressions, the bottom of the trough, the present stream, nearest to the eastern or innermost ridge. These depressions, these hollows, would drain into each other through the lowest lines, or the sloughs, build up, through vegetable growth and sedimentary deposition, into flat prairies, while the rolls and knobs would leach out, become more friable, marly, and, together with any superficial deposits of sand or gravel, become the sites of groves and belts of timber. The farther north, the ridges closing on each other, becoming broader and flatter, the more characteristic this development, the larger depressions producing great bogs, swamps and lakes. In time, as the sloughs cut down, prairies would become dry.

This whole conception is fully borne out upon the Desplaines watershed,—dry prairies, prairies still wet, peaty bogs and swamps, small and shallow lakes becoming so, and lakes so large and deep that wave action maintains their integrity except in sheltered areas, all with more frequent belts and groves of timber northward.

This condition of things in nature makes the surface more absorbitive, and to a greater depth, and arrests the waters, delivering them more equably to the streams and maintains from the overflow of lakes and ponds and the leachings of swamps and bogs a better low water volume. The clearing away of the timber, the drainage of the wet prairies, the reclamation of bogs and swamps, removes the water faster, destroys the reservoirs of low water supply.

None of the watershed can be considered hilly or precipitous, although where the old outlet cut through the ridge, from Willow Springs to below Lemont, it has that appearance. Beyond the top of the bluffs, however, the usual characteristics of gentle undulations are observed. The lower part of the watershed was originally one-fourth to one-third timber, increasing northward to one-third to one-half the area.

The upper Desplaines valley above the Ogden-Wentworth dam, near Summit, has an area of 631 square miles and a length of 62 miles. This includes the Salt Creek valley which breaks through the dividing ridge near Fullersburg, its area above this point being 110½ miles with a length of 26 miles.\*

The fall in the flood plane of the Desplaines is 90 feet in 60 miles, or at the rate of 1½ feet per mile above the Lyons dam. The fall in Salt Creek is at the rate of 3 feet per mile for 18 miles above the Fullersburg dam. From the Fullersburg dam to the Lyons dam, in the pool of which Salt Creek empties, the fall is 41.3 feet, about 8 miles by the course of the stream and 5 by direct line. The Lyons dam is 24.2 feet above Chicago datum, or low water of Lake Michigan as adopted by the canal trustees in 1847.

Both the Desplaines river and Salt Creek, in their courses through Cook county above Summit, are very direct, without any material development in crooks and bends. They have very little width of flood plane, are virtually deep groves in the prairie, and extreme high water rises nearly to the prairie level. In Lake county the Desplaines shows more unevenness in grade, with some bottoms in places, more like natural lakes drained out than a flood plane excavated by erosion. At Riverside a rock barrier is crossed with a descent of about 14 feet in three miles. A dam exists at this point, and also at Half Day, in Lake county. There is also a dam at Fullersburg, on Salt Creek.

The lower Desplaines extends from the Ogden-Wentworth dam to the junction with the Kankakee, a distance of 41.6 miles—a total fall of 105 feet at low water and about 6 feet less in flood. The area is 758 miles, of which 172 lie above Dam No. 2, at Joliet, the area draining to the canal below Summit being included.

The drainage of this portion of the valley is in the old outlet, virtually a channel of passage for thirty miles without other tributaries than the bluff drainage. In flood, a portion

---

\*The normal valley of Salt Creek continued between the ridges down Flag Creek would give a length of 36 miles, and an area of 135 miles.

of the waters flow to Lake Michigan over the present artificial divide, the Ogden-Wentworth dam, by the Ogden-Wentworth ditch, which was designed to drain the Mud Lake region lying between the Desplaines and Chicago rivers.

In nature, the Mud Lake divide was near Kedzie avenue, Chicago, five miles east of the Desplaines at the dam. It was overflowed in floods for a wide extent, the surplus waters going to the west and south forks of the South Branch of the Chicago river. Mud Lake itself had considerable depth and was the route followed by the early French explorers and traders, and for these reasons no doubt the Desplaines was surveyed and reserved as a navigable stream to Lyons bridge.

Probably at one time, the entire upper Desplaines, and even as far south as the rock outcrop above Lemont, drained to Lake Michigan, the same as the Calumet basin now does. The south branch of the Chicago river to Bridgeport originally had a capacity proportioned to such a condition or about the same as the Calumet from a similar area, and the bed of Mud Lake for a long distance bears every indication of having been the bed of the Desplaines. The indications in the Desplaines valley below Summit, as previously explained, are all indicative of recent occupancy by the present river.

There are many ways in which the long flat divide at Kedzie avenue could have been built up and we believe there is a tradition that the bearer was concerned in the matter. In any event, the work once initiated, natural sifting would carry it on until the waters were turned out the old pass.

At the present time, a larger proportion of the flood waters of the Desplaines escape to Lake Michigan than under former conditions, for, though the dam is supposed to be at the old level of the natural divide, it is close to the Desplaines with a comparatively free channel of escape by the Ogden-Wentworth ditch.

The channel of the lower Desplaines is abnormal, or is determined by the conditions left by the ancient channel. In the "twelve-mile level," below Summit, there is practically little grade at any stage of water and the bed is the old remnant, or slough, among the boulders and in rock pockets. Thence to Lake Joliet, no channel has been cut by the present stream farther than to denude one to three feet of superficial deposits overlying the rock. For ten miles above Lake Joliet, the descent is at the rate of eight feet per mile. Lake Joliet and Lake DuPage are long, deep and wide pools, aggregating over eight miles and without sensible fall, entirely beyond any present forces or requirements. Between them are three miles of slope and one-half mile beyond Lake DuPage, over rock, the Desplaines unites with the Kankakee to form the Illinois.

The dams across the Desplaines are as follows: Daggett's Mill, one-half mile below Lockport; Dam No. 1, ten feet high, belonging to the State, Joliet; Dam No. 2, eight feet high, one-half mile below Dam No. 1, also belonging to the State, and Adam's Dam, six feet high and less than a half mile below No. 2. Formerly a dam existed at the foot of Lake Joliet at Treat's Island, and also one at the foot of Lake DuPage. These have long been abandoned.

The State dams form two pools, aggregating a length of one and one-quarter miles, in which the Illinois and Michigan Canal crosses the Desplaines river.

One mile below Dam No. 2, Hickory creek is tributary from the east, draining an area some 18 miles long and of 130 miles. Jackson creek enters from the east, near the mouth of the DuPage, draining an area 10 to 12 miles long and of 86 miles. Both of these streams belong to the outer slope of the rim ridge of the lake basin.

From the north, the DuPage enters four miles above the mouth, draining a basin, including Rock Creek, 40 miles long and 366 miles in area. This stream descends rapidly from Plainfield, but no detailed information is at hand. The canal crosses in a pool formed by the erection of a dam eleven feet high at Channahon, and formerly a feeder dam for the Joliet level existed above. The flow of the stream is better maintained in dry seasons than that of the Desplaines at Joliet.

The following tabular exhibit gives the distances, areas of drainage, elevations referred to Chicago datum and high water in the Desplaines river. The distances are given from the mouth of the stream and the elevations of low waters are + or - according as they are above or below Chicago datum, the low water of 1847 in Lake Michigan. High water

is in feet above low water. The areas are given to characteristic points and include that tributary to the canal below Summit; also river frontage over distance between points designated.

Point Designated.	Distance from mouth.	WATERSHED.		ELEVATION.		Remarks.
		Area.	Total.	Low Water.	High Water. 1881.	
Bowmanville Cu'-off..	60.0	440	.....	33.0	17.0	Near south line, Maine.
Riverside Dam.....	43.6	190	630	24.2	5.8	Salt Cr'k. $\frac{3}{4}$ miles above
Brewery Bridge.....	42.6	3	633	11.0	8.3	Navig'ble stream begins.
Ogden-Wentworth D.....	41.6	1	634	8.0	7.3	11.7 above datum .....
Willow Springs.....	35.2	.....	.....	8.0	7.1	.....
Sag.....	30.4	.....	.....	8.0	6.1	.....
Walkers Quarry.....	28.8	39	673	8.0	.....	Rock escarpment .....
Romeo.....	23.0	.....	.....	0.0	.....	Level of lake.....
Lockport.....	19.2	156	790	-22.0	4.8	Norton's Tail race .....
Dam No. 1.....	.....	.....	.....	-42.3	3.75	{ High water on dams.
Dam No. 2.....	14.6	16	806	-52.5	4.9	
Adam's Dam.....	.....	4	810	-60.5	6.0	{ Low water actual.....
Hickory Creek.....	13.6	130	940	-67.5	.....	{ Low water, 1883, taken below Joliet. High water estimated from best information. Below Lake Joliet is backwater from Kankakee in highwater.....
Head Lake Joliet.....	12.0	.....	.....	-77.0	5.0	
Foot Lake Joliet.....	6.8	.....	.....	-77.3	4.3	
Jackson Creek.....	4.8	86	1,026	-87.0	.....	
DuPage River.....	4.0	366	.....	-88.8	11.8	
Head Lake DuPage.....	3.6	.....	.....	-90.0	.....	
Foot Lake DuPage.....	0.6	.....	.....	-90.3	.....	
Illinois River.....	0.0	.....	1,392	-93.7	15.7	Junction Kankakee.....

The first area in the table includes the proposed diversion of the floodwaters of the Desplaines as contemplate by bill passed by the General Assembly in 1887. The route was along the south boundary of the town of Maine, down the valley of the North Branch and to the lake from Bowmanville, across Lake View north of Ravenswood. An additional area of 60 miles of the Salt Creek basin was also included in the estimates, or a total area of 500 square miles out of 634 above Summit. This project contemplated continuing the ordinary dry weather flow southward.

The Ogden-Wentworth dam at the Desplaines is a little more than four miles from the present city limits of Chicago and some six miles from deep water in the branches of the Chicago river. It is ten miles direct to Lake Michigan at the nearest point.

There is no considerable area of true bottoms along the Desplaines below Summit. Down to Lake Joliet, the stream has not cut a natural bed, or the banks are of little height, and the stream overflows widely for a half mile or more except on the steep slopes in the vicinity of Lockport. The State works conduct the waters through the city of Joliet. Aside from a limited area where Hickory Creek debouches there are no bottoms subject to overflow until the foot of Lake Joliet is reached, except a marshy fringe bordering the high ground on either side. In the seven miles below the lake to the Kankakee, true flood plane bottoms occur, mostly on Treat's Island and about the mouth of the DuPage. These, like all bottoms built up by overflow, are at mean extreme water and are overflowed in an occasional year. These bottoms are all within the range of backwater from the Kankakee and are only overflowed in case of floods from that stream. The area from Lake Joliet to the Grundy county line is ——— acres, of which Treat's Island contains ——— acres and the DuPage bottoms ——— acres.

The flood discharges in the Desplaines have been taken at Riverside and at Joliet, in some cases by actual observations, but generally from the high water marks giving the depth flowing over the dams. Such results, if carefully deduced, are reliable within a small percentage. The volumes are given in cubic feet per second, the usual unit of engineering measurement.

The flood which culminated at Riverside, on April 21st, 1881, is the most notable of recent years. Its volume was 13,500 cubic feet per second. Floods of nearly equal magnitude have occurred in other years, for which the notes are not at hand.



The highest flood since 1881 culminated on February 9th, 1887, with a volume of 10,324 cubic feet. It fell to 8,000 feet on the 10th, to 7,000 feet on the 11th and by the 16th had dropped to 2,000 feet, rising again on the 19th to 5,74 feet.

Every five or six years for 50 years, there has occurred a flood upwards of 10,000 cubic feet in volume. The memoranda are not in hand at this writing.

The ordinary yearly flood as deduced from marks at the Lyons dam, is 6,000 to 7,000 cubic feet per second.

From the Fullersburg dam, on Salt Creek, the four highest floods in thirty years give results, as follows:

1876—2,860 cubic feet per second.

1881—2,760   "   "   "   "

1886—2,612   "   "   "   "

1887—Feb. 10—2,860 cubic feet per second.

The mean may be taken at 2,800 cubic feet. It will be noticed that if the volumes of floods were in proportion to areas of basins, the flood at Riverside corresponding to the above should be 16,000 cubic feet. This is not true, however, for reasons previously given. The rule applied in basins of similar characteristics would give 9,000 feet. This ratio may apply for rain water floods, but in case of melting snow, with difference in latitude, as in all the larger floods, the problem does not yield to analysis.

The floods in Joliet are estimated from the hight on the three dams, and the results check each other closely. The following notable floods have occurred:

1877, April 7—6,410 feet per second.

1881, April 21—6,550   "   "   "

1883, Feb. 16—6,370   "   "   "

1887, Feb. 11—5,775   "   "   "

The highest mark in 21 years at Dam No. 1 gives 6,550 cubic feet. The mark pointed out by Mr. Adam above Dam No. 2, to which the water has reached three times in 30 years, gives 5,860. The normal extreme flood may be taken at 6,300 cubic feet per second, occurring probably four times in thirty years.

The flood of 1887, which reached its hight on February 11, with a volume of 5,775 feet, fell to 1,460 feet on February 16, and rose to 5,385 feet on the 19th. If these volumes be compared with those for Riverside, some idea may be formed of the volume escaping to Lake Michigan through the Mud Lake region.

The volume flowing through the Ogle-Wentworth ditch, as measured at Kedzie avenue in February, 1887, was, on the 10th, 7,800 cubic feet; 11th, 4,636 feet; 14th, 1,625 feet; 18th, 4,000 feet; 19th, 3,042 feet.

An ice gorge on the Desplaines on the 9th and 10th of February, affected the amount of water turned toward the lake, but it is apparent that in large floods not less than half the volume of the Desplaines passing Riverside goes to Lake Michigan. All the information obtainable also indicates that it was not materially different before the ditch was cut. The railway embankments across the Mud Lake valley have been compensated for by the gradual enlargement of the ditch, an operation which will continue in the future with an increasing discharge toward Chicago.

The present dam is 11.7 feet above Chicago datum, or 3.7 feet above low water, and 3.5 feet below high water of 1881. When the water in the Desplaines stands at the crest of the dam, the flow down the Desplaines is 800 to 1,000 feet per second, depending upon whether the water is falling or rising, or on the condition of vegetation in the "twelve-mile level." Above this volume, the proportion escaping to Chicago increases rapidly with the hight of flood, and for this reason the floods passing Joliet are more uniform in volume, one year with another, than at Riverside.

No data are in hand in regard to the flood volume from the DuPage. With this it would be possible to estimate closely the normal extreme flood from the Desplaines into the Illinois river. This probably does not much exceed 12,000 cubic feet per second.

It may be assumed thus that the normal extreme flood is, at Riverside, 12,000 feet; at Joliet 6300 feet; and at mouth of river 12,000 feet. Any flood above two-thirds these volumes would be a notable one; and probably average floods, one year with another, do not exceed this.

If the Chicago outlet were closed so as to turn all the water southward, the volume at the mouth of the river would be about 20,000 feet, upon the basis of 12,000 feet for Riverside; and at Joliet, the volume at Riverside would be increased by one-sixth.

The shape of the Desplaines basin, (long and narrow,) and the fact that it covers a considerable range in latitude, materially decreases the volume while increasing the duration. After heavy precipitation, the maximum flow will come from the immediate body of the watershed, while the flow from headwater will come in to sustain the volume and prolong the flood. In 1887 the river was falling at Riverside before the flood had culminated in Lake county. The melting snow on the northern portion of the basin will maintain the flow for several days after it has melted and run away from the southern portion. In 1881 the flood maintained its height nearly for four days, and lasted about 21 days. The ground was practically saturated when winter set in, and about one foot of water in the shape of ice and snow accumulated, and all ran out or melted during three weeks, at a temperature a little above freezing point and without material rain. The southern portion of the watershed was entirely bare before the northern snows began to melt. For this reason the flood volume held measurably constant, even toward the sources of the stream, until the snow at headwaters began to be exhausted. The conditions presented in this flood are of extraordinary occurrence only. On August 10th, 1867, a downpour of remarkable intensity and purely local to the watershed immediately north and east of Joliet, produced for a few hours an unprecedented flood, carrying away the guard bank of the upper pool and inundating a portion of the city.

These extraordinary occurrences do not, however, extend over wide areas, and for this reason their effects are local rather than general. If they did, the results would be vastly beyond experience upon large streams. Still, to the extent that extraordinary occurrences may be in a measure simultaneous in a long period of time, is due these great effects that may occur in a generation or a century. In these matters, the law of probabilities comes in with its grand and certain averages as much as in apparent accidents and insurance.

The dry-weather flow, or low-water volume, is very small, as has already been inferred from the physical characteristics of the watershed. In 1887, Salt Creek was entirely dry at Fullersburg. The Desplaines, at Riverside, reached a minimum of 4.27 feet per second (256 feet per minute), and for five months did not exceed 1,000 feet per minute. The stream has been known to be lower than this, but has never wholly run dry.

In 1879, a discharge taken by Mr. Matthewson at Romeo, four miles above Lockport, gave a volume of 5.65 cubic feet per second (339 feet per minute). The minimum volume at Riverside would not be increased, in fact, might be diminished, in passing through "the twelve-mile level," by evaporation and vegetation, in the run to Joliet. Three hundred feet per minute may be assumed as the mean extreme low water at Riverside and at Joliet, with a volume below 1,000 feet for several months of nearly every year.

For several years, owing to leakage in and about the Ogden-Wentworth dam, no low-water flow has gone below Summit for some months of nearly every year. This was the case in 1887, and also, we believe, in 1888. The ice interests below Summit have always remedied the matter in time for the winter ice crop.

No estimates have been made of the low water below Joliet, nor of the DuPage at Channahon. The DuPage is known to sustain its flow much better than the upper Desplaines, due probably to considerable area of permeable gravel beds, and to springs from the underlying rock in the lower part of its course. The Desplaines, below Joliet, is also under similar conditions. It is presumed, however, that the low-water volume of the Desplaines, at its junction with the Kankakee, will not be increased to over 17 to 20 feet per second (1,000 to 1,200 feet per minute) for its mean extreme low-water, and that it will run under 50 feet (3,000 feet per minute) for some months of nearly every year. The minimum of twenty years will probably be less than that given.

The effect of inhabitation has already been forecast. The draining out of the wet prairies, bogs and marshes, the clearing away of surplus timber, will make the floods come quicker and of greater height, and their duration will be shortened. The flow of the stream will be less sustained or the low water period much prolonged. In prolonged dry seasons, or in a succession of such seasons, the only sources of supply will be the

lakes, as the bogs and marshes will dry out and the permeable beds to feed springs are of limited extent and readily exhausted. The minimum flow at Riverside and at Joliet, will probably reduce to one-half or two-thirds its present volume,

The flood volume reaching Joliet will probably not increase, owing to the peculiar situation at Summit, by which an increasing proportion is likely to flow to the lake in the future, if the present conditions and tendencies remain unchanged. The flood conditions at Joliet would be the same as those above, provided the waters were prevented from reaching Lake Michigan, but this would increase flood heights at Summit by four or five feet. If the lands along "the twelve-mile level" were drained by cutting the rock escarpment at Lemont, a matter of no serious cost, the same results as to floods would obtain in Joliet.

The amount of surface washing or silt from the tilled ground will also increase, but these will not be largely carried southward beyond "the twelve-mile level" under present conditions, but will go for the most part into the Chicago river. Should, however, the changes be made as stated above, they would build up the Desplaines bottoms below Summit and ultimately fill up lake Joliet, until the prism is reduced to the requirements of an alluvial stream, a velocity in flood approaching two miles per hour in place of less than one-half mile as at present.

The remarks in regard to flood increase will also apply to the basin below Joliet. Owing to the conditions under which floods come from above, there will be no radical increase. The low water volume in this portion of the stream will be better sustained, as the permeable beds are of greater extent upon the lower watershed. The rock water will not alter materially in volume. The area of pond or lake is, however, very limited. The siting from the increased supply of detritus will reduce Lake DuPage, as already intimated, in regard to Lake Joliet.

As a whole, the floods will probably be somewhat increased at the mouth of the river, but to no considerable degree, unless the entire Desplaines is turned southward. The silts carried away will ultimately increase considerably. The minimum volume will probably not reduce beyond one-half or two-thirds the present amount. Had we records of the primitive conditions, it is likely that material changes would now be evident.

These changes are likely to reach their limit in fifty years. After that, the area in trees is likely to increase rather than diminish, the effects of drainage will have been fully developed, the ponds and lakes will not be farther reduced,—may be increased,—and the general permeability of the surface will increase with the fuller development of the country. The water supply to towns and villages from sources not now contributing will ultimately reach the streams.

All these conclusions are based on the supposition that no radical change be made in the old outlet such as restoring thereto a part of the outflow of the great lakes, and also without regard to the present contributions from the Illinois and Michigan canal.

The hydrography of the Desplaines basin has been discussed at length on account of its very important relations to any plans for the increase of flow from Lake Michigan at Chicago, and also to the economic and sanitary problems of that city and its environs.

#### THE KANKAKEE WATERSHED.

The Kankakee unites with the Desplaines to form the Illinois, after running for two miles in Grundy county and just west of the Will county line. It drains an area of 5,146 miles, 3,040 of which lie in the State of Indiana and the remainder in Illinois, principally in Will, Kankakee and Iroquois counties.

The general direction of the basin is east and west, with an extreme length of 216 miles and a greatest width from north to south of about 70 miles. The watershed may be considered as one basin lying between the main rim ridge of the lake and the outer ridge of the Lake Michigan glacier, these two ridges closing in Indiana in harmony with the effects of the Saginaw and Lake Erie glaciers. Although the general area is not sub-divided by well defined ridges, 2,000 square miles drains to the Iroquois, the main tributary, and some 650 miles to the Yellow river, in Indiana, also a tributary from the south. There are no other well defined tributaries from the south except Horse Creek,

an area of about 100 miles, entering the stream four miles above Wilmington. All the northern tributaries are in small watersheds of 50 to 100 miles, and are simply drains for the slope of the northern bounding ridge,

Below Mومence on the Kankakee and the north line of Iroquois county on the Iroquois, the streams descend rapidly and the general slope of the country is ample for good drainage. This area is some 770 square miles, and its general characteristics are similar to the Desplaines watershed. The same may be said of some 430 miles along the slope of the northern ridge east of this district. The remainder of the watershed, nearly 4,000 miles, is flat or gently rolling and at least one-half in marsh, wet prairie or lake, the Kankakee marsh alone covering about one thousand miles as a single body of land.

The larger proportion of the basin is underlain by the Niagara limestone, with possibly some Devonian and Carboniferous beds under the upper part of the basin in Indiana. The lower coal measures underly the headwaters of the Iroquois and it is supposed that the series of rocks adjacent to the great anticlinal axis may be upturned in narrow outcrops beneath the drift in the southwest portion of Iroquois county. From Mومence on the Kankakee and the county line on the Iroquois, the Iroquois and Kankakee are cut in the Niagara limestone as far as the Will county line and thence to the mouth in the shaly calcareous beds of the Cincinnati group.

Owing to the depth of the drift, the character of the underlying rocks is not well defined over a large portion of the basin. They do not belong to groups carrying any considerable water bearing strata, although the lower courses of the Niagara and the Cincinnati group may furnish a limited supply to the lower Kankakee. The copious supply from shallow artesian wells, flowing water from the base of the drift, is supposed to come from the upturned edge of the St. Peters sandstone, unable to find an outlet through the impermeable clays of the upper drift. This area is limited and in the southwest portion of Iroquois county, a region drained by Spring Creek, a considerable tributary of the Iroquois river. Doubtless as the name of this creek indicates, some of the pent up waters find their way to the surface.

Geological studies indicate above the rock edges at Mومence and on the Iroquois, an old trough from Lake Michigan, several miles in width. The course of this channel is southwesterly, gradually curving westerly under the site of Bloomington and to the valleys of the Sangamon and Illinois. The surface features left by this old channel are almost obscured by the last glacial period, the channel is entirely filled and obliterated. It represents same earlier glacial track and it may have had the same relation to the valley of the Sangamon and the great central basin of the State that the last glacier had to the present Illinois.

The drift overlies the rock, generally to a depth of not less than 100 feet, its depth not being well ascertained over the upper basin. It is unmodified or arranged by flowing water in large part and to that extent is not water bearing. At the same time there are probably a larger depth of superficial deposits of a permeable character than in any other basin of the Upper Illinois watershed.

There is a larger proportion of sand and gravel beds upon the ridges and throughout the watershed. Glacial flow has more or less arranged the deposits above the unmodified drift over a considerable proportion of the lower areas. The drainage of the retreating Saginaw glacier, and perhaps of the Lake Erie glacier also, flowed down the valleys of the Kankakee and Iroquois in a shallow bed, several miles in width, carrying all the finer clays and leaving only the heavier sands and gravels. The shores of these old streams are ridged in sand, the outlines of the present great marsh in Indiana, of the valley of the Iroquois, and these sand deposits continue down the deep cut valley below the junction, especially on the south side, well down into Grundy county.

The character of the drainage upon the northern slopes has been already alluded to. To the south it is much flatter and greatly diversified in marsh, lake and roll. This is true in a remarkable degree of the watershed of the Yellow river in Indiana, and to a less degree of the Iroquois in Indiana, and in Iroquois and Ford counties, Illinois.

The banks of streams, the ridges and the higher and more permeable areas with natural drainage have been generally wooded, especially in Indiana. Some of the sandy deposits have, however, been too barren to sustain any considerable vegetation of any kind.

The surface is generally covered to a good depth with soil, though, as already inferred, much of it partakes of a sandy character. The great areas of marsh are virtually prairies in process of formation, in a manner not unlike that pursued by nature in past ages.

The great marsh in Indiana demands special notice. It heads very near to the big bend in the St. Joseph river at South Bend, Indiana, and indeed the St. Joseph valley is but the general continuation to the E. N. E. of the Upper Kankakee valley. It would be a matter of no great difficulty to turn the waters of the St. Joseph across the portage and down the Kankakee, a route followed so often by the early French voyageurs. Already a portion of the marsh has been drained across the portage to the St. Joseph river.

The elevation at the summit is 145 feet above Lake Michigan. The head of the present marsh is 141 feet above the lake, or 104 feet above the dam at Momence, and the declivity is very uniformly distributed over the general length of the marsh, 82 miles, giving a grade to the valley of 1.27 per mile. The width of the marsh varies from one to twenty miles with an average of about ten miles, and its mean elevation is 90 feet above Lake Michigan. The area of lands which would be benefitted by the reclamation of the marshes as assessed by the Kankakee Valley Draining Co., was about 1,000 square miles. An official report made to the Governor of Indiana in 1882, gave the lands to be directly reclaimed at 400,000 acres or 625 square miles.

The same report gives the character of the underlying deposits. The soil proper, is a dark, sandy loam, ranging in thickness from one to five feet, underlaid by fine sand, increasing downward to coarse sand and gravel, with occasional thin clayey layers, all to a depth of eight to ten feet. No rock was encountered in any portion of the valley.

Father Stephan, who was long interested in land reclamation, gives the length of the river in Indiana at 242 miles while by the general course of the river it is but 88 miles, a development in bends of over  $2\frac{1}{2}$  times the general length, the average grade being about five five inches per mile. Down to Momence, the stream would be 252 miles in length, on a course of about 95 miles.

Above the Ft. Wayne railroad crossing, the stream flows through the marsh without well defined banks, and it is only after its junction with the Yellow river that it can be properly considered as a river. Above the junction, the area is 1,300 square miles, equally divided between the Kankakee and Yellow rivers. This area is about 60 per cent. of that above Momence. The small tributaries are usually lost in the marsh before reaching the main stream.

□ From the junction of the Yellow river to Momence, the general distance is 60 miles, and the fall 57 feet, or nearly one foot per mile. The developed length is probably about three times the general course of the stream. The stream is a clear, flowing body of water with a depth of three to five feet at low water, and with a sandy, gravelly bed.

At Momence are two dams, on opposite sides of an island, the crests three feet above the limestone outcrop in the bed of the river above. The river drops to eight feet below the crest of the dam in one-fourth mile, and in a rock bed falls 20 feet more in 14 miles, to the junction of the Iroquois, after passing the dam at Waldren,  $6\frac{1}{2}$  feet high. The total area of the watershed is 2,540 square miles, of which 2,342 miles lie above Momence, and 2,212 miles in Indiana.

The Iroquois has an area of watershed of 2,000 miles. It is of steep declivity over rock for about five miles through Kankakee county, but above this the stream is of little grade and of good depth, navigable, in fact, to Watseka, the junction of Sugar Creek. Above this the stream is more broken, and comes directly from the east, the area in Indiana being 828 miles. The area at Watseka, including Sugar Creek is, roughly, 1,500 miles, or three-fourths the total watershed.

The principal tributaries below Watseka are Spring Creek and Longham's Creek, both heading in marshy areas in Ford county, and Beaver Creek, a marsh-draining stream.

The large proportion of marsh upon the Iroquois watershed has already been alluded to. No data are at hand in regard to the elevations, height of floods and volume of water in this stream.

The lower Kankakee, at the junction of the Iroquois, is nine feet above Lake Michigan, and descends rapidly over a rock bed to its junction with the Desplaines, 93.8 feet below Lake Michigan, a total fall, in round numbers, of 103 feet in a distance of 33½ miles, or about three feet per mile. There is a precipitous descent of some 20 feet at Alton, and another of like amount at Wilmington. The drainage tributary is 606 square miles.

The following table gives the distances from the mouth of the river and the elevations at low water, referred to Chicago datum. The data at hand are somewhat confusing, but the results are believed to be approximately correct:

Place.	Distance.	Elevation.	Remarks.
Illinois river.....	0.00	-93.7	Junction with Desplaines ....
County Line.....	2.25	-89.1	East line Grundy county.....
State dam (above).....	5.25	-67.6	Feeder of Canal.....
Dam No. 1 (above).....	6.00	-58.5	Kankakee county, 12 ft. high.
Dam No. 2 (above).....	10.00	-49.5	Wilmington, 11 feet high.....
Dam No. 4 (above).....	11.50	-37.0	Great dam, 16 feet high.....
Foot of rapids.....	21.50	-37.0	.....
Alton.....	22.50	-17.0	Dam destroyed.....
Kankakee City.....	30.00	+ 1.0	Below dam.....
.....	30.00	+ 9.0	Above dam.....
Mouth of Iroquois river	33.50	+ 9.0	In Kankakee pool.....
Waldron.....	35.00	+16.0	Above dam, 6½ feet high.....
Momence.....	47.25	+29.0	One-fourth mile below.....
.....	47.50	+37.0	Pool, above dam.....
State Line.....	54.50	+40.0	General distance.....
Baums Bridge.....	82.50	+79.0	.....
Mouth of Yellow River.....	107.00	+94.0	.....

The Kankakee feeder joined the canal in a course of 4¼ miles from the State dam, at an elevation of 68 feet below the Chicago datum. In conjunction therewith, the navigation company improved the river to the head of the pool created by the Great Dam above Wilmington, 21 miles from the Illinois and Michigan Canal. The company abandoned the structures some years since, except those necessary for water power in Wilmington, and Dam No.1 has been cut down two feet. The feeder was abandoned by the Canal Commissioners in 1888, and the dam is in bad condition. Dam No. 3 at Wilmington is on the opposite side of the island from No. 2. It will be seen that the Kankakee is crossed by dams at seven points.

The general height of the immediate banks of the stream in Indiana is not found, but in one report it is stated that a rise of eight feet will flood the marshes for several miles in width. At the State line high water is about six feet, and on the dams at Momence 0.83 feet, and immediately below two feet. Below Momence, high water is reported at ten feet, and below the mouth of the Iroquois not over eight feet, until near the mouth of the river. This no doubt varies, being less on the quick descents and more on the easier slopes. In 1887 the water rose 10 feet at Wilmington, below the lower dam, and at the mouth of the river nearly sixteen feet.

The banks of the river are stated to be fifteen feet high at Momence, growing higher as the stream is descended. At Kankakee they are stated at twenty-five feet, increasing toward the mouth to thirty-five feet. There are some limited areas of bottoms between Momence and Waldron, but practically none from Waldron to the mouth; in other words, no overflows occur on the Kankakee below Momence.

The data in regard to the flow of water in the rivers of the Kankakee watershed are very meager.

The flood volume at Momence can only be inferred from the hydraulic conditions as set forth in various reports. It is probably not far from 6000 cubic feet per second at the high water mark of an occasional year, or this may be assumed as extreme mean high water, beyond which floods will not occur once in a generation.

Considering the fact that 2342 square miles of watershed are above Momence, or 45 per cent of the total area of the Kankakee basin, this volume is remarkably small, and shows the impounding effect of the Kankakee marshes. Were all the conditions normal, the flood volume at Momence would be about 26,000 cubic feet per second.

The practical effect of the marshes is similar to that of a lake, reducing the extreme volume and prolonging the time of floods, while at the same time a considerable proportion of the waters is retained to maintain the ordinary flow of the stream. The highest waters in the marshes occur in summer, when vegetation retards the ready discharge, though it is doubtful if this corresponds to the greatest volume carried by the stream.

At Wilmington, the flood of 1887 culminated on February 19th, with a volume over the great dam of 25,150 cubic feet per second. A rise of less height occurred on the 11th. It was this earlier rise, in combination with the rise which culminated at Joliet on the 11th, that gave the high water at Morris on the 11th, 12th and 13th. The second rise at Morris, on the 19th, came within one foot of the first, but the flow of water from the Desplaines was less. The high water of 1887 is regarded as a remarkable one, the highest for ten years at Wilmington.

Mr. E. S. Waters, who was engineer for the Water Power Company, gives the highest water which occurred for the twelve years ending 1883. His results indicate a maximum flood of 35,000 cubic feet per second. The breaking of an ice gorge above the dam in 1883 occasioned a temporary discharge of over 100,000 cubic feet per second.

Two of the most notable floods occurred in 1851 and in 1867, the latter accompanied by an ice gorge, and referred to at Wilmington as the greatest known. Other remarkable years were 1830, '37, '44, '53, '58, '69, '76, and '81, though all these dates have not yet been verified. This would give twelve notable floods from 1830 to date, or an average of one each five years.

Some of these have doubtless exceeded 30,000 cubic feet per second, and this may be assumed as mean extreme flood volume. Probably any flood exceeding a volume of 20,000 cubic feet would be classed as a notable one.

The area of basin above Wilmington is 4,926 square miles. Were its characteristics similar to those of the Desplaines basin, the flood volume at Wilmington should exceed 47,000 cubic feet per second.

If 30,000 be assumed as mean extreme flood, these volumes would be increased about four per cent. at the mouth.

Owing to the area of the basin and its large proportion of flat ground and marsh, floods culminate slowly. At Wilmington, the floods generally take two and a half to three days to culminate after heavy general precipitation. The following extract from a letter from Mr. E. S. Waters, engineer of the Waterpower Company at Wilmington for over twelve years, and who was interested in observing such matters, covers all that need be said upon the matter at this time.

"It is difficult to give any definite answer to your inquiries for the reason that the winter and spring freshets bring the storm waters to Wilmington sooner than the summer or autumn rains. Usually, after a heavy general rain, the river begins to swell in about eight hours after a heavy downfall, the river becoming blackish roily, such water coming from the drainage valley of Horse Creek. Twelve hours after the storm, the river swells still more, retaining the same general color which is caused by waters from Rock Creek. The Upper Kankakee [probably below Momence] brings down clearer water so that the color of the freshet water is made materially lighter in color. The freshet reaches its height in about 36 hours from commencement of rise, and the waters will then fall a few inches until the Iroquois waters again swell the river, such water making its appearance in from 36 to 40 hours, and being light yellow in color, caused by the wash of the clay banks on the Upper Iroquois."

"A heavy rain that fills the marshes of the Upper Kankakee will keep up a good supply for six weeks even in time of *extreme drought*. These marshes act as a large gathering ground, and the exit from the marshes being narrow and the stream very crooked, the water is impounded and the marsh acts as a reservoir."

It is to be inferred from this letter and also from the general conditions that the Upper Kankakee does not contribute materially to the maximum volume, but comes in later to prolong the rise.

The extreme low water at Wilmington for the twelve years preceding 1883, from data furnished by Mr. Waters, was 420 feet per second (25,200 feet per minute.) This, however, continued for less than one week. The usual low water run is given at 1300 cubic feet per second (7,000 cubic feet per minute) and the common run for eight months in the year does not fall below 2,350 cubic feet per second (201,000 feet per minute.)

On September 9, 1867, a measurement was made near the mouth of the river in connection with the survey for the improvement of the Illinois river. The volume was 27,377 cubic feet per minute. The streams are said to have been lower in 1867 than for the preceding twelve years.

Two measurements were made above Mokence, December 12-13, 1871, for the Kankakee Draining Company, and the volumes ascertained have been used as the ordinary flow of the stream for the purpose of computing the capacity of ditches for draining the marshes. The measurement at the State line gave 1,271 cubic feet per second (76,260 cubic feet per minute), and at Mokence, 1,457 cubic feet per second (87,420 cubic feet per minute.) The flow for eight months is probably in excess of these volumes. They are not far, however, from what Mr. Waters gives as ordinary low water at Wilmington and it is known that this is maintained largely by the flow from the marshes above Mokence. No data are in hand in regard to the flow from the Iroquois.

The mean extreme low water at the mouth may be taken at 30,000 cubic feet per minute. The volume has been less than this twice if not three or more times in thirty years. It is probable that the minimum will run under 76,000 cubic feet per minute for some months of nearly every year.

The effect of inhabitation will be most marked upon the flow of waters from the Kankakee basin. This tributary, more than any other, and in a degree only approached by the Fox, is the controlling factor in the regimen of the Illinois river as far as the mouth of the Sangamon. More, also, than any other will its regimen be radically changed by the reclamation of its marshy areas and the general improvements that will be made in the drainage of its lands during the next fifty years.

In a minor and desultory way, much has already been done to make apparent the tendencies. The borders of the great marshes have been narrowed, drainage districts have organized and put ditches through large areas, minor areas have been ditched by local owners and lands tilled, everywhere and constantly, the tendencies are to destroy the reservoirs which hitherto have maintained an equable flow. Already it is noticed that floods "come quicker" than formerly and the low water's volume is less sustained.

All this drainage is easily accomplished, the only obstacle being that association of effort which has not hitherto proved practicable. The great bodies of marsh all have ample grade, the waters are impounded by the rank vegetation upon the considerable slopes, the streams are sinuous lines or sloughs, which void the water slowly; in fact, we have in the Kankakee basins great prairies in process of formation in a manner not unlike that by which prairies have formed in the past. Gradually they grow higher, imperceptibly the water is more largely confined to the line of drainage, the stream grows more defined and capacious, discharging the waters more rapidly, broad expanses, overflowed in high water, succeed, the wet prairie stage is reached. The channel is defined, it crooks and loops about in order to keep its grade down, so that its velocity shall not exceed the limit for a stable channel. With this process, however, there comes a time when the growing capacity of the stream is greater than is consistent with stability, when the increasing velocity moves the material of the bed in a greater degree, bonds erode, cut-offs occur. The equilibrium is destroyed, the stream concentrates, shortens, cuts deep into the superficial deposits until its grade is reduced to stability, or non-erodable strata or sorted stream bed arrests its further deepening. The prairie is drained, a deep drainage line, perhaps a valley, is excavated, and lateral drains or valleys are thrown out. This, in a few words, is the general process of evolution.

The Kankakee marsh is a great prairie in process of formation, on a general slope of over one foot per mile, much too great for a stable river in an alluvial channel. It is



underlaid by many feet of sand and gravel. It has a sinuous drainage line, with all the development in length possible without its bends looping into each other, and thus its grade and velocity are reduced so as to be in equilibrium with the material of its bed; thus it maintains a stable course. A few cut-offs, a shortening of the stream, will quicken its velocity, set it to eroding its bed and banks, gather in more rapidly the overflow waters, and thus, in a few years, a radical change may occur.

It is proposed to cut down the rock barrier at Mokence and remove the dams. The State of Indiana is already making provision for the execution of a great main ditch, which will have three times the grade of the original stream and be much deeper, as proposed in the report of 1882.

Such a ditch will undoubtedly drain the marshes. It will do more. It will enlarge, deepen; lateral drains will cut out through the marsh until the underlying clay is reached, when the erosion will be less pronounced. Millions of yards of sand and silts will be carried down the Kankakee, will pass the heavier grades of the Illinois and stop in the lower river, where present natural forces will be inadequate to their removal. All this will occur quickly, within a few years after the main ditch is so developed as to gather the waters. The marsh will be deeply drained, and man has only to initiate the effort.

All this in a minor degree will occur in the drainage of other marshes, but none of them are so characteristic or extended in the peculiar development described.

While it may not be public policy to obstruct such operations, we must not be unmindful of the effects. It is sometimes possible to make the injury as little as consistent with the greater purposes to be accomplished.

No doubt within fifty years all the marshes will be reclaimed, the wet lands drained, the bogs, ponds and lakes reduced. The streams of the Kankakee watershed will then be subject to conditions differing radically from the present.

It will have quite a large proportion of its area permeable to a considerable depth on comparatively level surfaces. This condition will reduce floods, distribute flow in the streams and make the low water more persistent as compared to some other basin like the Desplaines for instance. At the same time it lies in a uniform latitude, so that the snows will melt over its basin more uniformly and it lies more nearly in the track of the summer storms.

It is doubtful if its flood volumes will be less in proportion. The ordinary flow will be better maintained on account of the greater proportion of permeable strata. The extreme low water volume in some years of persistent or in succeeding years of drought will be proportionally as low, as the permeable areas are of two little depths and the drains may not cut sufficiently deep to even get their full effect.

If these general ideas be applied then there may be expected ultimately a flood volume at Mokence of not less than 26,000 cubic feet per second, or four times the present volume, and it will come quicker and be less prolonged. At the mouth of the river the volume will probably increase to 45,000 or 50,000 cubic feet per second, or be increased over fifty per cent beyond present extreme floods.

The low water volume at the mouth occurring in an occasional year may be less than 5000 cubic feet per minute, one-sixth of that now assumed, and it will probably be less than 10,000 cubic feet per minute in many years. The Yellow river, many years ago, in its natural condition, with its large development in lake and marsh and timber, gave a measured flow as low as  $1\frac{1}{4}$  cubic feet per minute per square mile. This has since no doubt sensibly reduced. The entire watershed will doubtless give less in time.

A large proportion of these effects are likely to be brought about quickly by the wholesale draining of great marsh areas. Accompanying such operations will be an enormous increase in the supply of detritus until the drainage lines are finally established in natural equilibrium. Even then the detrital load will be multiplied over the present amount, as the increased washings from the tilled and sandy ground will no longer be impounded in the adjacent marsh, but will go to the drainage channels.

It will be seen how radically detrimental to the interests of the Illinois valley may be the complete reclamation and inhabitation of the Kankakee watershed.







---

REPORT OF PROCEEDINGS

OF THE

**ILLINOIS STATE BOARD OF HEALTH.**

---

ADJOURNED MEETING, SPRINGFIELD, FEBRUARY 5-7, 1885.

---



---

REPORT OF PROCEEDINGS

OF THE

ILLINOIS STATE BOARD OF HEALTH.

---

ADJOURNED MEETING, SPRINGFIELD, FEBRUARY 5-7, 1885.

---

AN adjourned meeting of THE ILLINOIS STATE BOARD OF HEALTH was held in the rooms of the BOARD in the Capitol building, at Springfield, February 5-7, inclusive, 1885.

Present: Newton Bateman, R. Ludlam, A. L. Clark, W. A. Haskell, George N. Kreider and John H. Rauch—the President, Newton Bateman, in the Chair.

The minutes of the regular quarterly meeting, January 15—from which the present meeting stood adjourned—were read and approved; and the regular order of business being dispensed with during the first day's session, the BOARD proceeded to the election of officers for the ensuing year, with the following result:

The Hon. NEWTON BATEMAN, LL. D., Galesburg, President.

A. L. CLARK, M. D., Elgin, Treasurer.

JOHN H. RAUCH, M. D., Chicago, Secretary.

W. A. HASKELL, M. D., Alton, and W. R. MCKENZIE, Chester, Auditing Committee.

The evening session of Thursday was occupied in routine business and in the informal consideration of cases under the Medical-Practice Act.

On Friday the regular order of business was resumed, and under the call for reports of officers there was presented the following—

### QUARTERLY REPORT AND ANNUAL SUMMARY OF THE SECRETARY

There were received in the Secretary's office during the year 1884, a total of 3,374 communications, embracing letters, postals, reports, etc., and 5,744 were written and sent—532 being received and 685 sent during the December quarter. Of printed matter—including the Fifth Annual Report (2,957 copies); Preventable-Disease Circulars; Public-Health Laws of Illinois and Sanitary Memoranda; Vaccination Circulars, Instructions and Certificates; Sanitary Inspection Circulars and Instructions, etc.—nearly 250,000 copies have been distributed. During the September quarter alone, the aggregate weight of the matter distributed by mail and express was over four tons.

The publications of the BOARD now available, and for which there is a more or less constant demand—exclusive of its series of Annual Reports, Official Registers, and Conspectus of Medical Colleges—embrace the following:

#### PREVENTABLE-DISEASE CIRCULARS:

- No. 1.—Concerning the Prevention of Small-Pox. 8vo., pp. 12. In English, German and Scandinavian.
- No. 2.—Diphtheria.—Its Prevention and Control. 8vo., pp. 8. In English and German.
- No. 3.—Scarlet Fever.—Its Prevention and Control. 8vo., pp. 10. In English and German.
- No. 4.—Typhoid Fever.—Its Sanitary Features; Prevention of its Spread. 8vo., pp. 8. In English and German.

#### CONCERNING SMALL-POX AND VACCINATION:

- Blanks for Report of Small Pox Cases.
- Blanks for Report of Cost of Small-Pox.
- Suggestions for Reports of Small-Pox.
- Scholar's Certificates of Vaccination.
- Return of Vaccination Certificates by Teachers.
- Instructions concerning Vaccination.
- Circular-Letter to County Superintendents concerning Vaccination
- Vaccinal History blanks.

#### CONCERNING SANITARY INSPECTION AND THE WORK OF PREPARATION IN VIEW OF A THREATENED EPIDEMIC OF ASIATIC CHOLERA:

- Practical Recommendations for the Prevention of Asiatic Cholera.
- Suggestions and Instructions concerning Sanitary Inspection and Work—
  - To County Clerks.
  - To County Commissioners and Town Supervisors.
  - To Those in charge of Public Institutions, Almshouses, Jails, etc.
  - To Municipal and Health Authorities of Cities, Towns and Villages.
  - To Editors of the Daily and Weekly Press.
  - To Railway Officials.

#### VITAL STATISTICS:

- Blank forms for Returns of Births, Deaths and Marriages.
- Instructions for Compiling the Condensed Return of Deaths. Revised, January, 1885.

#### MISCELLANEOUS:

- Public-Health Laws of Illinois and Sanitary Memoranda.
- Common Dangers to Health.
- Sanitation of our Younger Cities.
- General Sanitation.

The SIXTH ANNUAL REPORT, including the *Official Register*, revised to December 1, 1884, and the *Conspectus of Medical Colleges*, revised to December 20, 1884, has been completed and is already partly distributed. Special editions of the *Register* and *Conspectus*—600 copies of each were distributed in December to the faculties of medical colleges, to editors of medical periodicals, and others directly concerned with the subject of medical education



## CERTIFICATES AND LICENSES.

Applications for certificates have been received from 597 physicians during the year. In 480 cases the certificate has been issued, and in the remaining 117 the application was refused or withdrawn on account of the inability of the applicant to comply with the requirements of the BOARD under the provisions of the Medical-Practice Act.

Of the 480 certificates granted there were 441 based upon the diplomas of 1883-84 issued by medical colleges which have, *prima facie*, complied with the Schedule of Minimum Requirements entitling them to be classed as in good standing; or upon diplomas issued prior to the session of 1883-84 by colleges then recognized as in good standing. In 30 other cases the graduates of colleges which had not fully complied with the BOARD's Schedule, were granted certificates upon undergoing satisfactory examination in the branches or subjects omitted.

Out of 47 colleges whose diplomas of 1883-84 have been presented as the basis for certificates, 21 have failed to fully conform to the Schedule, and their graduates have been required to supplement the evidence of the diploma by submitting to examination. In a number of such cases the applicants have declined to appear, and have withdrawn their applications and left the State.

Of the remaining 9 certificates, of the 480 issued during the year, 7 were granted to exempts upon proof of sixteen or more years' practice in the State, and 2 upon examination in all branches to gentlemen holding the diplomas of colleges not recognized by the BOARD. At the regular annual examination a class of thirteen non-graduates presented themselves, but none succeeded in attaining the required percentage entitling to pass.

In the 117 cases in which certificates were refused, the refusal was based upon one of the following causes:

1. Failure to present a diploma from a legally-chartered medical institution in good standing as defined by the BOARD.

2. Failure to sustain a satisfactory examination sufficiently strict to test the qualifications of the candidate for the practice of medicine.

3. Personal or professional antecedents, habits or association, warranting the charge of unprofessional and dishonorable conduct.

4. Proved intent to practice in an unprofessional and dishonorable manner, as by claiming to cure incurable maladies; to possess unusual skill, experience or facilities; and similar claims involving deceit and fraud upon the public.

Five certificates have been revoked upon proof of unprofessional and dishonorable conduct, and charges have been received and investigated, or the investigation is still pending, in some fifty other cases.

Applications for certificates have been received from 73 midwives, including 17 during the last quarter. Of these, 47 have been granted—30 upon diplomas or licenses of recognized schools of midwifery; 16

upon satisfactory examination; and 1 upon proof of sixteen years' practice in the State. There were rejected 15 of those who appeared for examination, and the credentials of 11 others were refused as being from institutions not recognized as in good standing.

#### MEDICAL EDUCATION.

During the past year the Schedule of Minimum Requirements has been enforced as the test of recognition of diplomas issued at the close of the sessions of 1883-84. The effect of this action of the BOARD upon the standard and methods of medical education in this country has already been treated of in the last Summary Report, prefacing the Sixth Annual, as also in the remarks introductory to the Conspectus of Medical Colleges. That there is a marked improvement in some respects is generally conceded; and, on the whole, the BOARD has ground for satisfaction with what has been already accomplished and for encouragement for the future.

#### THE MEDICAL-PRACTICE ACT.

Suits and prosecutions under the Medical-Practice Act, or arising from proceedings thereunder, have in all cases, except those in Chicago, terminated promptly and favorably. One of the most important of these suits was that tried in the Sangamon County Court in May last, and in which the Court sustained the right of the BOARD to inquire into and determine the moral and professional status of applicants for its certificates, and to withhold such certificates from those whom it adjudged guilty of unprofessional and dishonorable conduct, regardless of the character of the diploma presented.

Among recent cases of violations of the act and of proceedings resulting therefrom, are the following:

*Funk, alias Talbot.*

In October last a complaint was received that one "J. A. Talbot" was practicing medicine at No. 1915 State street, Chicago, in violation of the Medical-Practice Act. Upon investigation it was found that he was a student attending lectures at the Chicago Medical College, and claimed to be practicing only as the assistant of Dr. Otto Wegner, his preceptor. Wegner and "Talbot" were at once advised as to the proper construction of the clause concerning the practice of students, which restricts them to prescribing under the supervision of a preceptor, and "Talbot" was notified to desist from the practice complained of.

About the first of November "Talbot" opened another office at 2896 Archer avenue, also in Dr. Wegner's name, but visited patients and prescribed for them as "Dr. Talbot," and solicited practice through the medium of the following card (printed in English and German) in which it will be noticed that "Dr. Talbot-Astley," as he then styled himself, had reversed his relations with Dr. Wegner—the latter having become "Talbot's" assistant:

The great London physician and surgeon, Dr. Talbot-Astley, of the St. Thomas Hospital, London, member of the Royal College of Physicians and Surgeons, has been induced to establish the Illinois State Dispensary, Chicago, chartered for the successful and scientific treatment of all chronic, nervous, eye and ear, throat and chest diseases, gout,

rheumatism, asthma, consumption, kidney and liver complaints, disorders of the blood, stomach and bowels, and especially all diseases of women and children; also skin diseases, private diseases and all wounds, sprains and dislocations. Visits \$1. Office fees 50 cents. All persons who are unable to pay will be treated free of charge. Dr. Talbot-Astley will also visit patients if sick in bed. Confinements carefully attended. Dr. Wegner, late surgeon of the German army, will assist Dr. Talbot-Astley. English, German and Polish spoken. Office open every morning from 9 to 11. Office open every evening from 7 to 8. Preserve this card and present it at the office, No. 2896 Archer avenue."

The so-called "Illinois State Dispensary" had no existence, and was not "chartered" as claimed; but under the statute governing the granting of charters, there would have been no difficulty in securing one, as in the case of the "St. Jacob Institute" of the "James' Medical Institute," of the "Chicago Medical League," etc.

Pending the accumulation of proof of specific violation of the law upon which to base "Talbot's" arrest and prosecution, it was learned that his real name was Otto Funk and close upon the heels of this discovery came his arrest for stealing books from the Chicago Public Library. With this denouement the interest of the BOARD in the case terminates so far as "Talbot" or Funk is concerned, but I think it advisable that Dr. Wegner, who claims to have been his preceptor for two years previous to October 9, 1884, should be given an opportunity to explain to the BOARD his relations with a man who had already and notoriously been under a cloud.

*Lambrecht alias Lüder's alias Lambert.*

At a meeting of the BOARD in October, 1882, the certificate previously issued to "Henry A. Lüders" of Chicago, St. Louis, and Collinsville, Madison county, was revoked upon proof that the diploma of the University of Göttingen, on which the certificate was issued to him, had been fraudulently obtained, and that the man was an imposter. It may be remembered that it was finally ascertained that his name was not "Lüders," but Lambrecht; and that he was guilty of gross malpractice and brutality during his brief career in Collinsville. He has recently been heard of in Bismarck, D. T., where he is known as William Lambert.

After his flight from this State he went to Cincinnati, where he obtained a certificate for a course of lectures at the Cincinnati College of Medicine and Surgery; but upon the publication of his record in this State he suddenly left Cincinnati without completing the course. He next appeared in Cleveland, where, in July, 1883, he married again without going through the formality of obtaining a divorce from his St. Louis wife, whom he deserted when he left Collinsville. During the winter of 1883-84 he attended the Keokuk College of Physicians and Surgeons and received the diploma of that institution at the commencement in 1884. The recent correspondence represents him in the same unenviable character that he sustained in this State.

His admission to the lecture-classes of the Cincinnati school and his graduation by the Keokuk College, furnish fresh illustrations of the necessity for the strict enforcement of matriculation requirements and of proof of previous study and college attendance. It is obvious that this man could not furnish "credible evidence of good moral standing," nor proof of having attended two full courses of lectures. Nevertheless, he was matriculated at both schools, and graduated from one.

*Lucas R. Williams, alias "Dr. Lucas."*

In December, after protracted delay, the case of Lucas R. Williams, *alias* "Dr. Lucas," of Chicago, was tried in the Cook County Criminal Court, and the defendant was found guilty and fined \$50 and costs.

Notwithstanding the revocation in 1880 of this man's certificate for grossly unprofessional and dishonorable conduct, he has continued to ply his disreputable and demoralizing vocation in defiance of the law, emboldened thereto by his belief in the efficacy of his diploma as a protection. Under the cloak of the cheap and easily-obtained articles of incorporation he converted his office into "Dr. Lucas' Private Dispensary, chartered by the State of Illinois, for the Special, Scientific and Speedy Cure of Private, Nervous and Chronic Diseases." The Chicago Tribune, commenting upon this phase of quackery, and upon this individual quack, says in its issue of February 17, 1884:

Hundreds of persons are imposed upon by these words, which bear the interpretation, as intended, that he has the specially granted sanction of the State. The truth is that no such sanction has been given, and the real interpretation ought to read, "Incorporated," etc. This private dispensary of Dr. Lucas is simply a joint stock company, created under the act of the General Assembly of the State of Illinois, entitled "An Act concerning Corporations." This law allows three persons to form a corporation for "any lawful purpose except banking, insurance, etc." The Secretary of State has no option in granting articles of incorporation when the forms of the law are complied with, beyond compelling the new organization to desist from using the name of any corporation existing in the State. The ease with which it was formed can be seen from the necessary expenses contracted. They are as follows:

Corporations for pecuniary profit—	
For filing articles of organization.....	\$1 00
For issuing license.....	1 00
For certificate of organization.....	1 00
For filing Commissioner's report.....	1 00
For copy of papers.....	1 50
Total.....	\$5 50

This small sum of money is the outlay necessary to obtain that which is valued so highly. Under the cover of a "lawful purpose" this unlawful concern exists, the law containing no provision for revoking the certificate of a fraudulent corporation. The laws need to be amended either to allow this revocation or to specify more minutely the purposes for which corporations can be formed. The amount of stock issued by this company is \$500, a sum no more than necessary to buy a good microscope. Scientific instruments, however, are encumbrances seldom indulged in, and when in stock are only kept for view in the offices of Chicago charlatans. Dr. Lucas has a criminal record which is steadily growing, and is reputed equally as guilty as Smith Whittier of sending his filthy, libidinous, and obscene publications through the mails to school-girls.

The language of the first section of the act above referred to is as follows: "That corporations may be formed in the manner provided by this act, for any *lawful purpose* except banking, insurance, real-estate brokerage, the operation of railroads and the business of loaning money." Ostensibly the practice of medicine is a "lawful purpose," but if practiced in violation of a specific law which prescribes certain qualifications for those engaged in its practice it undoubtedly becomes an unlawful purpose; and the question suggests itself whether the existence of such a law (the Act to Regulate the Practice of Medicine) should not raise the inquiry whether those applying for license to incorporate for the practice of medicine are eligible for such practice under the act of 1877.

In any event it would seem fitting that since the practice of medicine is regulated by a specific statute, this "lawful purpose" should be excluded from among those for which charters may be obtained under the general statute, in the same way that "banking, insurance, real-estate brokerage, the operation of railroads and the business of loaning money" are excluded.

I have to suggest that this matter is one worthy the attention and action of the committee on legislation.

The technical defense set up in Lucas' or Williams' case was that the BOARD, having granted him a certificate upon the diploma of a reputable college, had no power to revoke its certificate—notwithstanding his notoriously unprofessional and dishonorable conduct; and upon this point his attorneys have taken an appeal from the finding of the Criminal Court.

*George J. Williams.*

This man—the brother of Lucas R. Williams, or “Dr. Lucas”—has also been recently tried and found guilty, but the sentence has not yet been pronounced pending the result of an argument for a new trial. Until within a few years, George J. Williams was, by profession, a lawyer; but, being a witness to the facility with which the suffering and unfortunate among the public are duped and fleeced by brazen quackery, he went to Milwaukee and advertised himself as “Dr. Lucas,” following the lines of his brother, Lucas R., of Chicago, although without any study of medicine or attendance upon medical lectures. About two years since he returned to Chicago, and opened an office at 14 South Clark street. He was soon after arrested, indicted, pleaded guilty and was fined in the U. S. District Court for sending obscene literature through the mails. Not being a legally-qualified practitioner himself, he has tried to get a graduate in medicine to superintend his business, but until recently without success. His publications and advertisements have been of the boldest and most shameless character, styling himself “The Most Expert Physician in the World,” “the Expert Specialist who stands *high in his Profession* and has *devoted a lifetime* to the study of the treatment and cure of—” here follows a list of diseases and symptoms disgusting alike in grossness of language and suggestion. To such an extent has public decency been outraged by his publications that the attention of the police was attracted, and he and his distributors on the street were arrested, his place was raided and his pamphlets, circulars, etc., together with the stereotype plates were destroyed.

Alarmed at his approaching trial, Williams has changed his advertisements, signs, etc., using the title “St. Jacob Institute”—another concern “incorporated especially for the relief of suffering humanity,” and has succeeded in inducing a graduated physician, who holds the certificate of the BOARD, to act as his stool-pigeon in the ostensible capacity of “Superintendent”. He has also recently taken out tickets for a lecture course in one of the Chicago colleges, and now claims to be practicing as a student under a preceptor. The substance of his “little red book” and other publications suppressed by the police and the United States authorities, he now circulates under the form and name of “The Chicago Library,” published semi-monthly, price three cents.

If precluded from the pursuit of their nefarious business in the methods hitherto employed, it is understood to be the intention of

these charlatans to incorporate as proprietary-medicine companies, under the general act already referred to—an intent which furnishes another argument for the proposed amendment of the statute.

Cases against other of the Chicago quacks are still pending.

#### THE PUBLIC HEALTH.

At the close of the December quarter there remained the same gratifying condition of the public health as noted from time to time during the year. The graver contagious diseases—small-pox, diphtheria, scarlet fever and typhoid—have not prevailed to an epidemic extent in any locality. Localized outbreaks of small-pox, due in all cases to contagion imported from neighboring States and confined to those who had neglected vaccinal protection, have occurred in Alexander, Clark, Coles, Crawford, Jefferson, Kendall, Marion, Perry, Pulaski, Randolph, St. Clair, Sangamon and Washington counties. At Yorkville in Kendall county, Coulterville in Randolph county, and at East St. Louis, the conditions were such as to necessitate the personal attention of the Secretary. From professional incompetency and municipal neglect the outbreak at Centralia resulted in 32 cases and 6 deaths, and the contagion was thence carried into Washington, Jefferson and Sangamon counties. At the close of the year the State was entirely free from the disease so far as reported, and there had been only four mild cases in two localities—1 at Palestine in Crawford county, and 3 at Darwin, Clark county—during the preceding three months. Several cases were brought into Chicago during the year, but in only one instance did a resident of the city contract the disease from any of these imported cases.

Except in one or two localities neither of the remaining important contagious diseases—diphtheria, scarlet fever, typhoid—has presented features demanding special attention,

On the 25th of December, the State Veterinarian reported a suspected case of glanders in the human subject, on a farm near Elmore, in Peoria county, and on the 26th Dr. J. H. Utley, of Springfield, was dispatched to the locality under the authority of the BOARD.

The following is Dr. Utley's report:—

SPRINGFIELD, ILL., December 27, 1884.

SIR:—In compliance with your instructions, I yesterday afternoon visited the farm of William B. Rearick, near Elmore, Peoria county, and investigated the case of his son, believed to be suffering from glanders.

It appears that the patient, Abram B. Rearick, aged 22 years, was taken sick about the 17th of October last. He complained at that time of severe pains in head, back and limbs; chills followed by flushes of heat; irritable stomach and constipation. He was compelled to take to his bed and remain there. These symptoms appeared after he had been engaged for some weeks attending to some horses suffering with glanders.

During the first week in November, small lumps appeared upon his arms and hands; these swellings soon broke down and discharged a thin sanious fluid. The swellings were red and painful. As the condition of the upper extremities improved, the lower became involved in much the same way, the nose began to discharge a little, and profuse sweats came on at irregular intervals. The face and forehead do not appear to have been very much affected at any time. The hectic and other symptom have continued with some little improvement until now.

A careful examination revealed the following lesions: Ulcer on outer aspect of right leg near ankle joint, edges sharply cut, abrupt, bottom covered with gray slough and some granulations. Skin of leg thickened in places and scaling. Some purple spots over sites of nodules which had escaped ulceration. Glands in both groins enlarged and painful. Left knee swollen and painful. Left leg affected in same way as right, with the exception that the ulcers are somewhat smaller. Mucous membrane lining nose somewhat inflamed and discharging a small amount of thick, tenacious muco-purulent matter.

The frontal sinuses are not affected. The axillary and submaxillary glands are not now enlarged; neither could I find any lesions of the skin of the trunk or upper extremities. There is no perceptible odor about the patient. Weakness and emaciation are considerable. Appetite good. Bowels costive.

The history of the case, and the lesions of the glandular and tegumentary systems, leave no doubt, in my mind, that this is a case of glanders. The attending physician, Dr. John Craven, of Elmore, who was present at the examination, also believes it to be glanders.

The usual precautions were directed to be taken, viz., cloths and dressings of ulcers to be burned, bedding fumigated or destroyed, room ventilated and disinfected, family quarantined. The precautions to be taken under the direction of Dr. Craven.

In conclusion I take pleasure in stating that every facility was afforded by the family and the physician in attendance to make my examination as thorough and complete as possible.

Very respectfully, your obedient servant,

TO JOHN H. RAUCH, M. D.  
*Secretary of Illinois State Board of Health.*

J. H. UTLEY, M. D.

A report recently received from State Veterinarian Paaren leaves no room to doubt the existence of another case of this disease in the person of Mr. Frank A. Curtis, living near Belvidere in Boone county. This makes three cases of glanders in the human subject at present under treatment in the State—the third case being that of a woman at Batavia in Kane county.

#### PREPARATIONS FOR CHOLERA.

In accordance with the authorization of the BOARD at its last meeting, I attended the adjourned meeting of the National Conference of State Boards of Health, at Washington, December 10th, 11th and 12th. The report of the proceedings had at that meeting is now in the hands of the printer, and copies will soon be distributed.

The House Committee on Public Health, to which was submitted the bill, prepared by the Conference, for the re-organization of the National Board of Health, has decided that there will be no time during the present session of Congress to secure the enactment of any new measure of so comprehensive a character. It has, therefore, recommended the appropriation of \$25,000 for the existing National Board of Health, and of an additional sum of \$500,000 to be used at the discretion of the President.

If these appropriations were made immediately available the work of preparing the general defences against the introduction of Asiatic cholera might be begun at once, and probably so far perfected as to furnish a reasonable assurance of safety before the usual increase of immigration.

Occasional cases of cholera have continued to occur in Europe, during the winter, and its epidemic increase on the approach of warmer weather is assumed by all authorities; so that it is no longer a question, in the minds of those qualified to judge, as to the certainty and the extent of the danger to which this country is exposed.

This danger has been pointed out from time to time in these quarterly reports ever since the spring of 1883, and the Damietta outbreak in the summer of that year. But now, on the threshold of the threatened invasion, the question of the duty and responsibility of the National government in the premises is still a matter of discussion.

Speaking of the appropriations above referred to, the New York Medical Record, in a recent editorial, says:

Meantime, the season is fast approaching when the first cases of cholera, the *avant courriers* of the epidemic, make their appearance among the immigrants. In our opinion, if adequate preventive measures are to be planned and put into successful execution against the present threatened invasion, the whole machinery must be in full operation, at the latest, as early as the 1st of April. Now, what does this preparation imply? First, that the National Board of Health shall plan and adopt the measures which are to be relied on to prevent the introduction of the cholera contagion. Those measures cannot be matured in a week, nor in twice that time, by the most experienced sanitarians in the country. They must necessarily involve interests of the highest importance to the traveling public, to the steamship companies, and to the foreign commerce of the entire country.

It will undoubtedly be alleged that the scheme of preventive measures above outlined is unusually comprehensive, and that their execution will prove expensive. Both statements are true. We propose nothing less than the *prevention* of an epidemic of cholera in this country.

No half-way measures, as the past history of the pestilence proves, can accomplish that result. Every avenue of approach is to be guarded, all along the lines of travel, by a large force of skilled officers. Is the object sought worth the effort and expense? We believe it is. An invasion of cholera means, the death of thousands of the laboring people, the occurrence of tens of thousands of cases of sickness, and the loss of millions of dollars in business. In our view prevention at any cost is comparatively cheap.

We repeat, the National Board of Health should meet at once and continue in session until its measures are not only matured but put into effective operation. It is stated that it has no means, even to pay office rent, owing to the failure of Congress to make an appropriation last year. If that is true, there is still the Epidemic Fund, to be used at the discretion of the President in the event of a threatened or actual epidemic. There is no reason why the expenses of the Board should not be defrayed out of that fund. President Arthur knows well what an epidemic of cholera means to the health and business interests of New York. Let us ask him, in all seriousness, if cholera is not sufficiently threatening to make it incumbent on him to use that fund to prevent the invasion.

This BOARD has more than once recorded its views upon the subject of a National health service; but the present emergency makes it imperative that it should again give formal expression to a well-considered opinion upon the necessity for prompt and efficient action in the interest of the public health and the general welfare.

The suggestions of the Record are timely and practical, and I recommend their endorsement by the BOARD, adding thereto an urgent request that the appropriations recommended by the House committee be made immediately available on the ground of an existing emergency; and that a joint resolution of Congress be adopted, empowering the President to suspend immigration from infected countries, upon the recommendation of the National Board of Health.

The preparations in our own State are in a satisfactory condition of forwardness. Much work in the abatement of nuisances and general cleaning up has already been done. But more importantly than this, the public mind has been aroused to the necessity for the work, and, to a great extent, instructed in its methods. The blanks and schedules for the general sanitary survey of the State are being prepared and will be distributed, with the necessary instructions, in season to resume operations as soon as the weather will permit.

I have also prepared, and will submit to the BOARD at this session, an estimate for the efficient quarantine of the State, should such a measure become necessary through the introduction and spread of cholera in the region east or south of us. This estimate embraces the probable cost of maintaining inspection stations, providing for the sick, disinfection, etc., at 24 points of entrance of important railroad



lines along the eastern boundary of the State, and at the necessary points on the Ohio and Mississippi rivers, as well as for defraying the expense of the necessary measures for preventing its spread from point to point within the State, should the disease be introduced.

This estimate was submitted to Governor Hamilton, and is referred to in his message to the General Assembly in the following terms :

A very important subject for the consideration of the General Assembly presents itself in this connection. Asiatic cholera has, during the past year, made fearful ravages among the population of European countries, especially in Spain, Italy and France. According to the usual history of this scourge its course runs westward around the world. The chances of its reaching this country next summer are very great, and its frightful visitation to the United States can only be prevented by extreme vigilance on the part of both the National Government and the States of the Union in enforcing thorough quarantine and sanitary regulations. The State of Illinois should be thoroughly prepared to meet this contingency through the agency of its Board of Health, under proper regulations, and equipped with an adequate appropriation to meet all emergencies. To completely quarantine the State of Illinois and protect it all along the eastern, southern and northeastern frontiers by systematic inspection at railroad crossings and boat landings would, in the estimation of the Secretary of the Board of Health, cost from \$80,000 to \$85,000, if this State were acting alone in the matter. But I take it for granted that the National government will do its whole duty in the matter, and that other States east of us will co-operate in protective measures, so that a much less sum will have to be provided by this State for the contingency. Therefore, I suggest that a contingent appropriation of \$40,000 be made, subject to the order of the Board of Health, to be used on approval of the Governor only in case of approach of cholera or other ravaging disease threatening the lives and health of large portions of the people of the State.

If the assumptions "that the National government will do its whole duty in the matter, and that other States east of us will co-operate in protective measures," prove to be well founded, the smaller sum will, in all probability, be sufficient. But there is no present assurance of either of these conditions; and if the pestilence effects a lodgment amongst us it will probably not be until after the General Assembly has adjourned, when it will be too late to increase the amount.

No dollar of any contingent appropriation made for the work of this BOARD has ever been expended without the clearest necessity therefor; and whatever sum was not absolutely required for the protection of the public health in the manner specified, has always been covered back into the Treasury. More than one-third of all such appropriations have been thus returned unexpended. In this fact is found sufficient warrant for making any appropriation intended for contingent use adequate to the possible extent of the anticipated contingency. If the contingency does not arise the appropriation cannot be used; and in any event only so much may be used as the extent of the contingency demands.

#### SANITARY CONDITION OF STATE INSTITUTIONS.

In connection with my inspection of State institutions with reference to the advent of cholera, among other matter the sewerage of the Joliet Penitentiary has received attention. The sewage and wastes of some 2,000 persons and the drainage of the enclosure are carried from the buildings and through the penitentiary grounds in a two-foot sewer; but a short distance beyond, the contents empty into an open ditch, about half a mile long, and through which the sewage is conveyed into the upper basin. Aside from the sewer gas, which is forced into the penitentiary buildings by winds from the southwest, the open ditch and the additional pollution of the upper basin are sanitary nuisances which should be abated as speedily as practicable.

Since the inspection was made some relief has been obtained by the use of disinfectants, which have been liberally applied at my suggestion; but this method of treatment is inadequate, and temporary. The obvious remedy and the only one which will meet the sanitary requirements, is the construction of a continuous sewer from the penitentiary termination to some suitable point of discharge on the river. An estimate, with a profile of the line of such sewer to empty into the river below Adams' dam, has been made at my request by Mr. J. M. Pierce, the city surveyor of Joliet. This contemplates 10,700 ft. of pipe sewer, 2 ft. by  $2\frac{1}{2}$  ft. in diameter, at a cost of \$26,450; or of stone, with a cross section of 30 inches, at a cost of \$32,100. This plan would probably need to be modified, both as to the point of discharge and the dimensions of the sewer; and, if ultimately adopted, the cost should be borne equitably by the interests involved, namely, the State, the city of Joliet, and the neighboring manufacturing industries.

It is suggested that prompter relief may be obtained—though not so radical or permanent as by the plan of a continuous sewer—by excluding from the present ditch the volume of water, some 5,000 cubic feet per minute, taken in by the Rebling paper mill. Or, if there are property rights in the way of such action, the same end might be attained by carrying the flow of the ditch from a point above this mill into the basin below the upper dam. The distance is about 400 feet and the fall of 40 to 50 inches in this distance would materially improve the flow from the sewer outlet, and to this extent afford relief from the existing objectionable features.

There are certain inherent conditions of the disposal of penitentiary wastes which complicate this question in other ways. A more abundant water supply, for example, is especially desirable in this case, if not indispensable to the prevention of more or less local nuisance.

As also connected with the sanitary condition of State institutions disclosed during my inspection, the need of a hospital building at the Asylum for Feeble-minded Children at Lincoln, was noted. Such a structure, entirely separate from the main building and so arranged as to be used for an isolation hospital for contagious diseases when necessary, is imperatively demanded by the present crowded condition of the institution and from past experience. An epidemic of scarlet fever less than two years ago resulted in fifty cases and six deaths among the children, besides extending to several attendants, when there is every reason to believe the disease might have been greatly limited had there been the necessary facilities for the proper care of those first attacked. A cheap frame structure, detached from the main building, and suitably equipped, should be provided as soon as practicable.

## FINANCIAL.

The following is the financial exhibit for the last fiscal year—that ended September 30, 1884:

FINANCIAL STATEMENT  
OF THE  
ILLINOIS STATE BOARD OF HEALTH,  
FOR THE  
FISCAL YEAR, ENDED SEPTEMBER 30TH, 1884.

*State Board of Health—Dr.*

<i>To State Treasurer:—</i>		
Balances of Regular Appropriations, October 1, 1883.....	\$6,558 54	
Balance of Contingent Fund, available October 1, 1883.....	5,000 00	
Regular Appropriations, taking effect July 1, 1884.....	9,000 00	
	<hr/>	\$20,558 54
<i>To Treasurer of Board:—</i>		
Balance in Treasurer's hands, October 1, 1883.....	\$189 06	
Office Receipts for year ended, September 30, 1884.....	877 00	
	<hr/>	1,066 06
		<hr/>
		\$21,624 60

*State Board of Health—Cr.*

By payment on all accounts as per itemized statement.....	\$10,280 40	
Unexpended balances of Regular Appropriations, October 1, 1884.....	6,676 80	
Unexpended balance of Contingent Fund, October 1, 1884.....	4,324 94	
Unexpended balance in hands of Treasurer of Board, Oct. 1, 1884...	342 46	
	<hr/>	\$21,624 60

ITEMIZED STATEMENT OF EXPENDITURES  
OF THE  
ILLINOIS STATE BOARD OF HEALTH,  
FOR THE  
FISCAL YEAR ENDED SEPTEMBER 30, 1884.

Salary of Secretary.....	\$3,000 00	
Assistant Secretary's salary and clerical services.....	4,345 83	
Traveling expenses of Board and Secretary.....	1,231 26	
Postage.....	320 43	
Expressage.....	272 98	
Telegrams.....	109 65	
Telephone.....	48 45	
Stationery and printing.....	202 25	
Medical journals, books and newspapers.....	271 32	
Legal services.....	145 00	
Detective services.....	153 95	
Vaccine virus.....	45 38	
Janitor.....	72 00	
Sundries.....	61 90	
	<hr/>	\$10,280 40
Total expenditures from Regular Appropriations.....	\$8,881 74	
Total expenditures from Contingent Fund.....	675 06	
Total expenditures from Office Receipts.....	723 60	
	<hr/>	\$10,280 40

Respectfully submitted.

JOHN H. RAUCH,  
*Secretary.*

On motion of Dr. Clark, the Secretary's report was received and ordered published in the report of the proceedings of the meeting. The suggestion concerning an amendment of the Act concerning Corporations was referred to the committee on legislation, and the remainder of the report to a special committee consisting of Drs. Haskell, Ludlam and Clark.

The rest of Friday's session was devoted to a discussion of the plans and preparations for resisting the threatened invasion of Asiatic cholera, during which the Secretary submitted the following estimate of the probable cost of guarding the State against the introduction of the disease, and of preventing its spread from point to point within the State should it be introduced.

LINES OF TRAVEL TO BE COVERED.	BY INSPECTIONS AT OR NEAR.	PROBABLE COST.
Baltimore and Ohio.....	South Chicago.....	\$9,000
Pittsburg and Ft. Wayne.....		
Lake Shore and Michigan Southern.....		
Michigan Central.....	Hammond.....	5,000
New York, Chicago and St. Louis.....		
Pittsburg, Cincinnati and St. Louis.....	Lansing.....	6,000
Grand Trunk.....		
Louisville, New Albany and Chicago.....		
Cincinnati, Indiana, Chicago and St. Louis.....	Sheldon.....	3,000
Wabash, St. Louis and Pacific.....		
Lake Erie and Western.....	Hoopeston.....	1,000
Wabash, St. Louis and Pacific.....	Alvin.....	7,000
Wabash, St. Louis and Pacific.....		
Indiana, Bloomington and Western.....		
Chicago and Eastern Illinois.....	Danville.....	
Indianapolis and St. Louis.....	Sanford.....	2,500
Terre Haute and Indianapolis.....	Farrington.....	3,000
Indiana and Illinois Southern.....	Palestine.....	1,000
Ohio and Mississippi.....	Wabash River.....	2,500
Louisville, Evansville and St. Louis.....	Mt. Carmel.....	2,000
Peoria, Decatur and Evansville.....	Grayville.....	1,000
Louisville and Nashville.....	Carmi.....	2,000
Illinois Central.....	Cairo.....	8,000
Mobile and Ohio.....		
Mississippi River.....		
Ohio River.....		
St. Louis Bridge.....	East St. Louis.....	6,000
Mississippi River.....		
Mississippi River.....	Sundry Points.....	10,000
Ohio River.....		
Total estimated cost.....		\$69,000
To prevent spread within the State.....		15,000
Total.....		\$84,000

On motion of Dr. Ludlam the foregoing estimate was approved, and the Secretary was directed to submit the same to the committees on appropriations of the General Assembly, and to furnish therewith copies of the remarks contained in his report in support of the estimate.

During the final session of the meeting, on Saturday, the following resolutions were offered and adopted:

By Dr. Kreider, for the committee on legislation—

**WHEREAS:** It has become a common practice for quacks, charlatans and other unprincipled and incompetent persons to obtain certificates of incorporation under the general Act concerning Corporations, approved April 18, 1872, and thence to advertise themselves as chartered by the State of Illinois, with the aim and intent of impressing the ignorant or unwary with the belief that the State has in some way granted them special privileges; and

**WHEREAS:** The said Act concerning Corporations excludes the business of banking, of insurance, of real-estate brokerage, of the operation of railroads, and of loaning money, from among the lawful purposes for which corporations may be formed; and

**WHEREAS:** The qualifications and requirements for the practice of medicine in the State of Illinois are prescribed by the Act approved May 29, 1877.

*Therefore be it Resolved,* That it is the sense of this BOARD that the first section of the Act concerning Corporations should be so amended as to include the practice of medicine among those pursuits or objects for which corporations may not be formed under the said Act.

*Resolved,* That the Secretary be and hereby is instructed to present copies of this preamble and the resolutions, and of that portion of his recent quarterly report which refers to this subject, to the chairmen of the Judiciary Committees of the two branches of the General Assembly now in session.

By the special committee on the Secretary's report, Drs. Haskell, Ludlam and Clark—

**WHEREAS:** The season is fast approaching when; it is feared, Asiatic cholera will again assume epidemic proportions in Europe and so threaten this country with a National calamity; and

**WHEREAS:** In the judgment of this BOARD such calamity may be averted by a system of preventive measures based upon the requirements of modern sanitary science;

*Therefore be it Resolved,* That this BOARD respectfully but urgently requests—First, That the President of the United States convene the National Board of Health forthwith, and put at its disposal, subject to his approval, the unexpended balance of the appropriation made at the last session of Congress for a contingent epidemic fund. Second, That the Illinois Senators and Members of Congress push the prompt appropriation of the sums recommended by the House Committee on Public Health. Third, That authority be, by a joint resolution of Congress, conferred upon the President to issue a proclamation forbidding immigration from infected countries whenever, in the judgment of the National Board of Health, such immigration threatens the public health of this country.

*Resolved,* That a copy of this preamble and resolutions, and of so much of the Secretary's report as refers to this subject, be forwarded to the President of the United States, to the Senators and Representatives in Congress from this State and to the members of the Public Health Committees of the Senate and House.

Also by the same committee, the following—

*Resolved,* That the disposal of the sewage of the Joliet Penitentiary should be so modified as to remove the present grounds of complaint and menace to health; and that the provision of suitable hospital facilities at the Asylum for Feeble-Minded Children at Lincoln, is a necessity.

*Resolved,* That the suggestions and recommendations of the Secretary in connection with these subjects be brought to the attention of the present General Assembly.

The committee on legislation also reported favorably upon the proposed amendments of the act to regulate the practice of medicine and of the State Board of Health act. On motion of Dr. Ludlam the report of the committee was adopted and the Secretary was directed to submit copies of the proposed amendments to the proper committees of the Senate and House.

The Treasurer, Dr. Clark, presented his annual report, as follows :

REPORT OF THE TREASURER  
OF THE  
ILLINOIS STATE BOARD OF HEALTH,  
FISCAL YEAR ENDED SEPTEMBER 30, 1884.

To the President and Members of the Illinois State Board of Health:

GENTLEMEN: Your Treasurer begs leave to present the following report of the receipts and expenditures of his office for the period commencing with the date of his last Annual Report, October 1, 1883, and ending September 30, 1884:

<i>General Account, Dr.</i>	
Balance to credit of general account, Sept. 30, 1883.....	\$189 06
Received of Dr. John H. Ranch, Secretary:	
Office Receipts for October, 1883.....	\$45 00
November, 1883.....	40 00
December, 1883.....	47 00
January, 1884.....	132 00
February, 1884.....	40 00
March, 1884.....	216 00
April, 1884.....	99 00
May, 1884.....	60 00
June, 1884.....	63 00
July, 1884.....	41 00
August, 1884.....	38 00
September, 1884.....	56 00
	877 00
Total available.....	\$1,066 06

<i>General Account, Cr.</i>	
Accounts paid by order of the Board for indebtedness accrued during the quarters preceding the respective meetings:	
January Meeting—for the quarter ended Dec. 31, 1883—	
Allan Pinkerton, detective service.....	\$76 20
Belleville Zeitung, printing Preventable-Disease Circular No. 2.....	53 00
	\$129 20
April Meeting—for the quarter ended March 31, 1884—	
Belleville Zeitung, printing Preventable-Disease Circulars Nos. 3 and 4.....	\$102 00
Allan Pinkerton, detective service.....	77 75
A. N. Linseott, legal services.....	70 00
T. W. S. Kidd, printing.....	50 00
G. N. Kreider, services.....	43 30
T. G. Vincent, clerical services.....	27 50
J. G. Kiernan, services, Ft. Wayne Medical College.....	15 00
R. E. Starkweather, clerical services.....	10 00
R. E. Starkweather, clerical services.....	10 00
	405 55
July Meeting—for the quarter ended June 30, 1884—	
Orendorff & Creighton, legal services.....	\$25 00
Jordan Murray, services.....	3 00
T. J. Thompson, services.....	2 50
	30 50
November Meeting—for the quarter ended Sept. 30, 1884—	
G. V. N. Lothrop, legal services.....	\$50 00
John H. Rauch, expense incident to trials.....	22 50
T. G. Vincent, expense incident to trials.....	15 85
J. S. Lowe, services.....	65 00
J. G. Kiernan, translating examinations.....	5 00
	158 35
Total expenditure.....	\$723 60
Balance in my hands Sept. 30, 1884.....	342 46
	\$1,066 06

All of which is respectfully submitted.

A. L. CLARK, Treasurer.

On motion of Dr. Kreider, the report was received and referred to the Auditing Committee.

Dr. Haskell, from this committee, reported that bills and accounts for the quarter, amounting to \$2,583.77, had been audited, found correct and recommended to be paid. Subsequently, the Auditing Committee returned the Treasurer's report, audited and approved.

During the executive sessions of the meeting, in the case of Dr. George William Bock, of Quincy, which was investigated at the November, 1884, meeting, and action then postponed on motion of the Secretary, further correspondence with the dean of the University of Göttingen, and other evidence was presented, which left no doubt that the diploma of the University presented by Bock, had been fraudulently obtained. In view of this state of facts the certificate No. 5290, issued to Bock, January 7, 1882, was ordered to be revoked.

Adjourned.

---





[S. B. H. No. 169.—10m—2-24-'88.]

---

ILLINOIS STATE BOARD OF HEALTH

---

PREVENTABLE-DISEASE CIRCULARS.

---

*No. 1.--SMALL-POX.*

---

THE first edition of this Circular was published in March, 1881, since which time some 75,000 copies have been printed and distributed throughout the State. The fifth and last edition—that of May, 1882—contains some allusions which are now out of date; those, for example, to the “past winter”—to the “mild and favorable weather”—and to the “proposed sanitary inspection of immigrants.” Aside from these, the comments, advice and instructions of this edition are as applicable now as when originally published. Their practical test in numerous instances has proven their sufficiency, and the remainder of the edition is now being distributed, as occasion requires, with no other change or addition than as contained in this Note.

With reference to the rights, duties and powers of health authorities in the matters of Vaccination, Isolation and Quarantine (see Rules 1 and 2, page 5,) it may be noted that in the early part of December, 1882, a suit was tried in the Mercer County Circuit Court, in which the plaintiff charged the Board of Health of Cable with trespass and false imprisonment—damages \$10,000. The damages were alleged to have been sustained by the enforcement of the quarantine rules and regulations of the local board, which were based upon the rules and regulations of the STATE BOARD, contained in this Circular. During the trial the question arose as to the authority to make and enforce such rules and regulations. The verdict of the jury was rendered in favor of the local board, thus sustaining its authority to enforce such measures as, in the exercise of a wise discretion, were deemed necessary for the protection of the public health.

Still more recently, in charging the Grand Jury at Paterson, N. J., Judge Dixon called attention to the case of a man employed as nurse in a small-pox hospital, and who, without proper precautions, visited his family, communicating the disease to his children, one of whom died therefrom. Hereupon Judge Dixon says: “If a man, conscious that he carries about with him the germs of a contagious disease, recklessly exposes the health and lives of others, *he is a public nuisance and a criminal, and may be held answerable for the results of his conduct.* If death occurs through his recklessness he may be indicted for manslaughter. It is held that where a person knowingly communicates a contagious disease to another, and death results, the crime is manslaughter.” Applying the law to the nurse's case, the judge instructed the jury that the man might be indicted for manslaughter, if it was found that there had been criminal negligence on his part; and that he might be indicted for spreading the disease by conscious exposure of others thereto, by his presence in public places, as on the streets, in halls, etc.—and this even though no evil consequences had followed, on the charge of being a public nuisance endangering the public health. “The law provides some penalty for such offenses against the public safety.” In other and older phrase: THE WELL-BEING OF THE PEOPLE IS THE SUPREME LAW.

These instances are cited in answer to frequent inquiries addressed to the BOARD, as to what extent courts and juries will sustain health authorities in their efforts to prevent the spread of epidemic contagion or infection.

SPRINGFIELD, ILL., February 24, 1883.

---

## OFFICIAL ORDER.

### Concerning the Prevention of Small-Pox.

---

Revised and in force January 1, 1882.

---

OFFICE OF THE SECRETARY,  
SPRINGFIELD, ILL., May, 1882.

While small-pox is diminishing in the State at large, there still occur outbreaks of the disease wherever the infection finds a community, or family, or individuals, not protected by recent vaccination.

Such persons are generally, (but not entirely,) found now only in the country or small settlements, where it has been difficult, during the past winter, to procure virus or the services of a vaccinating physician; or where there has been a prejudice against vaccinating until warmer weather.

These difficulties and objections no longer exist. Virus is plentiful; the great demand upon physicians has largely subsided; the weather is mild and favorable, so that there is little or no danger of complications; and there is now no reasonable excuse for neglecting this simple and only efficient safeguard.

Notwithstanding the proposed sanitary inspection of immigrants—by which it is hoped to check the further importation of the disease—there is no certainty that any given group of these people, now arriving in thousands every day, may not carry the infection into any township or locality, no matter how remote or secluded, and there cause an outbreak which will be limited only by the number of unprotected subjects who may be exposed.

I. In view of these facts it is the duty of those charged by law with the care of the public health—

First, and most importantly, to secure at once such a condition of every individual, child and adult, as will make him or her safe even if exposed to the contagion. *This can be certainly, readily, and inexpensively done by enforcing proper vaccination or revaccination, as the case may be.*

Secondly, to be vigilant against the introduction of the disease from without—as, for example, by a watchful supervision of hotels, lodging-houses and other resorts of travelers, and especial scrutiny of immi-

grants and new settlers. Although this is of incidental importance if the first injunction be obeyed, cases may occur where a non-intercourse quarantine might be justifiably enforced—as where a notoriously infected locality is lax in its protective measures, or allows its small-pox patients to wander off to other places.

Finally, it is the duty of all health authorities to be prompt and vigorous in enforcing such well-advised measures in the care of those who may, unfortunately, become afflicted (and of their families and households) as will prevent any spread of the disease. Under no circumstances must such cases be allowed to go at large, or be sent away to escape the cost and care of their proper treatment. *They must at once be rigidly isolated*, if necessary at the expense of the town, city or county; or, if transferred, by arrangement, to a neighboring small-pox hospital, the transfer must be effected in such a manner as to avoid the risk of spreading the contagion in transit.

II. In furtherance of these ends the appended *Rules and Regulations* of this BOARD—originally promulgated in March, 1881,—are again published, *with the knowledge that wherever they have been thoroughly carried out, small-pox has either been averted where it threatened, or readily controlled where it had already appeared.* A sanitary necessity still exists, and the BOARD is compelled, in the interest of the public health, to use the power conferred upon it by law to meet such necessity.

This order is issued in conformity with the statute which charges the STATE BOARD with authority in all matters pertaining to quarantine, and with the duty of making all necessary rules and regulations for the preservation or improvement of the public health; and such rules and regulations have, therefore, the weight and authority of law. By the same statute their enforcement is made binding upon all health authorities in the State. Such authorities embrace—

1. Regularly constituted *Boards of Health* of incorporated cities, towns and villages.
2. *Supervisors, assessors and town clerks* of townships; and
3. *County commissioners* of counties in which there are no township organizations.

The officers designated in the second and third classes constitute, *ex officio*, the Boards of Health, for their respective territories, in the absence of any other provision therefore.\*

---

\* In this connection attention is again called to the following *Order* of the STATE BOARD, made at its regular meeting, September 30, 1881.

Under the authority conferred upon the State Board of Health by section 2 of the State Board of Health Act, it is ordered that, on and after January 1, 1882, the first cases of small-pox occurring in any county, township, town or city in this State, as also the prevalence and progress of *any* epidemic, shall be promptly reported to the Board by the local health authorities; it being borne in mind that in counties where township organization exist, the township board is the Board of Health, and in counties not under township organization, the county commissioners act in like capacity.

Reports of first cases must be made immediately upon discovery; and of the progress of the disease from time to time—at least weekly. Forward all reports to the *Secretary, State Board of Health, Springfield, Illinois.*

All and singular of these are hereby charged with the enforcement of this ORDER and its appended rules. *Small-pox can be either totally excluded from any given community, or confined to the first cases, by so doing.* If it spread beyond the first cases, it is because of criminal neglect of these precautions, *for which neglect those who are responsible should be held accountable by their constituents.\**

All needed power and authority for the enforcement of these rules are provided by the law, and should be unhesitatingly employed whenever necessary. Police officers, sheriffs, constables, and all other officers and employes of the State are specifically enjoined by the statute to aid in the enforcement of such rules and regulations.

III. In this enforcement, if a question should arise as between private rights or interests and the interests of the health of the community, the public interest must be held paramount. Therefore, to the question, which is often asked of this BOARD, as to the *right* of recompense for losses incurred by the destruction of infected clothing or other effects, a negative answer must be returned. No individual has the right to preserve contagion or infection about his premises whereby the public health may be endangered. If the destruction of the infected material be necessary in order to destroy the contagion or infection, the loss must be borne by the owner; it cannot be recovered from the community.

As to the policy and expediency of reimbursing such losses, that is a question for the consideration of the proper authorities—town, city or county; and cases might arise in which relief would properly be afforded—as, for example, where such destruction would entail great hardship upon an indigent person.

Should the property of an innocent owner become infected through the preservation of known infected material—which it was the duty of the health authorities to cause to be destroyed—the value of such property, if destroyed to protect the public health, may be recovered under the constitutional provision that private property shall not be taken for public use or benefit without just compensation. This, however, applies only to the property of persons who are not in any wise responsible for the contagion, and who have taken reasonable precautions to prevent or avoid it.

IV. It is competent for local boards of health, as above defined, to incur expense for the vaccination of those who are unable to pay for the same; and they may, also, make such other expenditures, as in the

---

\* This assertion may be qualified in its application to large cities or other distributing points for newly-arriving immigrants. But even in such, with a proper system of rail and river inspection and vaccination of the unprotected, small-pox may always be held in control.

exercise of a sound discretion, may seem prudent and necessary either to effect a cure or to prevent the spread of any epidemic contagious or infectious disease—as, for example, by establishing a small-pox hospital, employing a small-pox physician, etc. Expenses so incurred should be paid out of the general fund of the municipal body (town, city or county,) incurring the same.

Concert of action between neighboring towns or communities, whose sanitary interests are often identical, is strongly enjoined upon the health authorities. Friction, clashing of authority and unnecessary expense may thus be avoided. Where there is no medical man upon a board of health, the advice and coöperation of the county medical officer should be secured; or, if this be impracticable, a competent and legally-qualified physician should be employed. If a district or locality become seriously infected, better work will be secured, with less danger of the contagion being spread, if such district or locality be put in charge of one medical officer, instead of allowing several physicians to visit individual patients or families. Such officer should be selected with an eye not only to his medical skill and experience, but also to his knowledge and ability as a sanitary executive.

Local boards and authorities are strongly advised against the policy of concealment. Small-pox cannot be suppressed by denying its existence. It *will* out, more certainly than murder. Official reticence in this is not only useless to protect commercial interests and reputation, but is in the highest degree mischievous, in that it begets false confidence, which may lead the innocent and unwary into such danger as an honest announcement of the facts would have warned them to avoid. Insist upon prompt publicity in every instance.

The following rules are believed to cover every important detail, and are part and parcel of this ORDER, to be strictly enforced in appropriate cases. A copy should be left in every house where there is a case of small-pox, and their republication in the local papers, or otherwise, is recommended. By this means a more ready obedience and intelligent coöperation will be secured, of the first importance in the present emergency.

No disease can be so surely prevented or controlled as Small-Pox. Its existence in a community argues unjustifiable prejudice, carelessness or ignorance, for neither of which is there any excuse.

BY ORDER OF THE BOARD:

JOHN H. RAUCH, M. D.,  
Secretary.

# RULES AND REGULATIONS.

## For the Prevention of the Spread of Small-Pox.

1. *Vaccination.*—Upon the first appearance of a case of small-pox in a given locality, systematic vaccination or re-vaccination must be at once resorted to—*vaccination* of all not previously protected, and *revaccination* in all cases where the operation has not been successfully performed within the past year. Recent experience has shown such an unusual susceptibility, both to the small-pox poison and to the vaccine virus, that it is not prudent to rely on an old vaccination, no matter how typical the scar may be. The inconvenience of vaccination is trifling compared with an attack of small-pox. If it doesn't "take" one may be assured of his safety if exposed—*provided*, the operation has been properly performed. If it does "take" it is conclusive evidence that the individual was in a condition to have contracted small-pox if exposed.

Vaccination should in all cases be performed by a legally-qualified physician; and too much care cannot be exercised in the selection of virus and the performance of the operation. It is recommended that a certificate be given to each person vaccinated, and the STATE BOARD will, on certain conditions, furnish blanks for this purpose on application. It is further recommended to managers, directors, superintendents, and others employing or having control of numbers of persons—as railroads, commercial and manufacturing establishments, private schools, colleges, universities, penal and reformatory institutions, asylums, public offices, steamboats, etc.—that they make vaccination obligatory upon all such persons.

Local boards and health authorities have the right to order compulsory vaccination at any time, and their orders may be enforced under penalty; or persons refusing to be vaccinated may be quarantined and otherwise treated as small-pox patients or "suspects," until the period of danger has passed. Where such persons (that is, those refusing to be vaccinated,) are known to have been exposed to the contagion—as, by visiting or living in close proximity to infected houses—they must, in all cases, be secluded for observation during the usual period of incubation.

2. *Isolation and Quarantine.*—Whenever it is known that any person is sick with small-pox or varioloid, isolation of the individual must be promptly and rigidly enforced. Every one in the house must be vaccinated or re-vaccinated, no matter how recently this may have been done, nor how mild the disease may appear. In view of the recognized difficulty of a positive diagnosis in every case, any reasonable doubt should be resolved in favor of wise precaution. It is by no means necessary that a case should present all the typical symptoms in order to initiate a malignant epidemic—even a mild case, with little or no eruption, may do this. Local health authorities cannot too strongly insist upon this important point.

In towns or cities where there are small-pox hospitals, it is better that the patient should be removed to such at once. Where there is no such provision, the infected house should be strictly quarantined, and, if necessary, the police authority must be invoked to secure proper restrictions. Under no circumstances should the inmates of such a house be allowed to go away from the premises, except by written permission of the health authorities. An improvised hospital will be an absolute necessity if the case occurs in a crowded family or a tenement-house, where proper isolation cannot be secured. In such case, a barn, outhouse or other building can usually be made sufficiently comfortable for the patient, at small expense; or, if the weather be mild enough, a tent may be used. A yellow flag or placard, bearing the words "SMALL-POX HERE!" should be prominently displayed upon the house, and not removed until permission is given by the health authorities. *Isolation and non-intercourse are matters of the utmost importance.* (See page 2, concerning the transfer of patients from one locality to another.)

3. *The Sick-Room.*—The room selected for the sick should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not absolutely needed in the room, should

be removed. A free circulation of air from without should be admitted, both by night and day—there is no better disinfectant than pure air. Place the bed as near as possible in the middle of the room; but care should, of course, be taken to keep the patient out of draughts.

If the room connects with others which must be occupied, lock all but one door for entrance and exit, and fasten to the door-frame—top, bottom and sides—sheets of cheap cotton cloth, which must be kept wet with *thymol water*, (see page 8,) or chloride of zinc solution—two drachms of chloride zinc to a half gallon of water. Over the door to be used, the sheet must not be tacked at the bottom nor along the full length of the lock-side of the frame, but about five feet may be left free to be pushed aside; this sheet, however, must be long enough to allow ten or twelve inches to lie in folds on the floor, and must, also, be kept wet with the disinfectant.

4. *Precautions in the Sick-Room.*—All discharges from the nose and mouth of the patient should be received on rags and immediately burned, and the same precaution should be taken with the crusts as they fall off. Night-vessels should be kept supplied with a quart or so of the *Copperas Disinfectant* (see page 8) into which all discharges should be received. All spoons, dishes, etc., used or taken from the sick-room, should be put in boiling water at once.

A pail or tub of the *Zinc Disinfectant* (see page 8) should be kept in the sick-room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be well boiled as soon as practicable.

5. *Attendants.*—Not more than two persons—one of them a skillful, professional nurse, if possible—should be employed in the sick-room, and their intercourse with other members of the family must be as much restricted as possible, and with the public only by written permission of the health authorities. All attendants should be re-vaccinated before taking charge of a small-pox patient.

In the event that it becomes necessary for an attendant to go away from the house, a complete change of clothing must be made, using such as has not been exposed to infection; the hands, face and hair should be washed in thymol water, or chloride of zinc solution. Following this, free exposure to the open air should be secured before approaching any one.

6. *Physicians and Visitors.*—Physicians and other necessary visitors, before

entering the sick-room, should put on an outer garment, closely buttoned up, and a handkerchief or wrap about the throat and neck. Such outer garment may be a linen duster or rubber overcoat; and this, together with the neck-wrap, should be taken off in the open air immediately after leaving the sick-room, and either be dipped in the *Zinc Disinfectant*, or hung up in an out-of-the-way place exposed to the air, until the next visit. Safety consists in exposing to the open air every article of clothing that has been in any way subjected to the contagion.

Whenever practicable the precautions above prescribed (*Rule 5*) for an attendant leaving the sick-room, should be observed by the physician or visitor. Doctors and clergymen may convey contagion as readily as the laity under similar conditions; they should, therefore, take the same precautions. This advice applies also to re-vaccination at the beginning of an outbreak. Several instances of physicians and clergymen falling victims to the disease, have come to the attention of the BOARD. It should be remembered that, whereas the average period of incubation for small-pox is about twelve days, vaccination acts in from six to eight. By vaccination, therefore, one may guard against the result of an exposure, even for some days after.

Physicians and clergymen may do much toward securing an intelligent compliance with these rules, both by precept and example, and their assistance should be invited in all cases.

7. *Miscellaneous.*—No inmate of the house, during the continuance of the disease, should venture into any public conveyance, or assemblage, or crowded building, such as a church or school; nor, after its termination, until permission is given by the health authorities. Letters must not be sent from the patient, and all mail matter from the house should first be subjected to a dry heat of 250–260 deg. F. Domestic animals, dogs, cats, etc., should not be allowed to enter the room of the patient, or, better still, should be excluded from the house. During the entire illness the privy should be thoroughly disinfected with the *Copperas Disinfectant*, three to five gallons of which should be thrown into the vault every three or four days. Water-closets should be disinfected by pouring a quart or so of this disinfectant into the receiver after each use.

8. *Care after Recovery.*—After recovery has taken place, the patient should be bathed daily, for three or four days, in a weak disinfectant—the thymol water or a solution of chloride of zinc (two drachms of the salt to a half gallon of water.) The



head should be thoroughly shampooed during each bath, and the convalescent be then clothed in fresh, clean garments that have been in no way exposed to the infected air. Patients should be kept in the house at least two weeks after the crusts have all disappeared.

9. *Death and Funerals.*—In the event of death, the clothing in which the body is attired should be sprinkled with thymol water, the body wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in the *Zinc Disinfectant, double strength*), and placed in an air-tight coffin, *which is to remain in the sick-room until removed for burial.* No public funeral must be allowed either at the house or church, and no more persons should be permitted to go to the cemetery than are necessary to inter the corpse.

The local authorities must take charge of burials, and superintend the preparation of the bodies.

10. *Disinfection and after Treatment of Premises.*—After recovery or death all articles worn by, or that have come in contact with the patient, together with the room and all its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fireplaces, flues, key-holes, doors and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three or four pounds of sulphur. All articles in the room and others of every description that have been exposed to infection, which cannot be washed or subjected to dry heat, and are yet too valuable to be burned, must be spread out on chairs or racks; mattresses or spring beds set up so as to have both surfaces exposed; window-shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should then be kept tightly closed for twenty-four hours. After this fumigation—which it will do no harm to repeat—the floor and wood-work should be washed with soap and hot water, the walls and ceiling whitewashed, or, if papered, the paper should be removed. The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten and shaken in the open air, and allowed to

remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable it should be removed from the room at the beginning of the illness. After the above treatment has been thoroughly enforced, the doors and windows of the room should, be kept open as much as possible for a week or two. Where houses are isolated articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article *it should be destroyed.*

All this work must be done—both the disinfection and the destruction of property—under the direct supervision of the local authorities.

11. *Treatment of Clothing, Bedding, etc.*—Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the *Zinc Disinfectant*; they should then be immediately and thoroughly boiled.

The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or "excelsior" filling. The clothing of nurses should be thoroughly fumigated and cleansed before it is taken from the house, or, better still, burned, if feasible.

In this connection attention is called to the fact that the disease has already been conveyed between widely-distant points, during this epidemic, through the medium of rags and paper-stock. In the present emergency authorities will do well to quarantine shipments of these articles unless accompanied by a certificate of their disinfection under competent supervision. In any event, it is incumbent upon owners of establishments in which such articles are handled to insist upon the vaccination or re-vaccination of all persons engaged in the work.

12. *Finally*, if, from neglect or delay in enforcing precautionary measures, the disease shows a tendency to become epidemic, the public and private schools must be closed, church services suspended and public assemblages of people, as at shows, circuses, theatres, fairs, or other gatherings, be prohibited. Neighboring communities are justified in declaring and maintaining a non-intercourse quarantine against any place in which, by neglecting the enforcement of this ORDER, small-pox is allowed to assume epidemic proportions.

## Best Disinfectants

Sunlight, fresh air, soap and water, thorough cleanliness—for general use.

For special purposes the following are the most efficient, the simplest and the cheapest:

### *I.—Copperas Disinfectant.*

Sulphate of Iron (copperas).....one and one-half pounds.

Water.....one gallon.

A convenient way to prepare this is to suspend a basket containing about sixty pounds of copperas in a barrel of water. The solution should be frequently and liberally used in cellars, privies, water-closets, gutters, sewers, cesspools, yards, stables, etc.

### *II.—Sulphur Disinfectant.*

Roll sulphur (brimstone).....two pounds.

To a room ten feet square, and in the same proportion for larger rooms. See *Rule 10* for mode of use.

### *III.—Zinc Disinfectant.*

Sulphate of Zinc (white vitriol).....one and one-half pounds.

Common salt.....three-quarters of a pound.

Water .....six gallons.

For application and modes of use see *Rules 4, 6, 9 and 11.*

### *IV.—Thymol Water.*

Made by adding one tablespoonful *Spirits of Thymol* to half a gallon of water. *Spirits of Thymol* is composed of—

Thymol.....one ounce.

Alcohol, 85%.....three ounces.

May be used for all the disinfectant purposes of carbolic acid; it is quite as efficient and has an agreeable odor. See *Rules 3, 5, and 9*, for application and uses. Where thymol is not available, chloride of zinc solution may be used—half an ounce of chloride of zinc to one gallon of water.

---

**THIS ORDER SHOULD BE PRESERVED FOR REFERENCE.**

## **PREVENTABLE-DISEASE CIRCULARS.**

---

THE following Circulars, concerning the Prevention and Control of Contagious Diseases, have been prepared and are published by the ILLINOIS STATE BOARD OF HEALTH:—

**No. 1.--SMALL-POX.**

**No. 2.--DIPHTHERIA.**

**No. 3.--SCARLET FEVER.**

**No. 4.--TYPHOID FEVER.**

Copies of these may be obtained by applying to the Secretary, JOHN H. RAUCH, M.D., Springfield, Ill.

---



ILLINOIS STATE BOARD OF HEALTH.

---

PREVENTABLE-DISEASE CIRCULAR.

---

NO. 2.--DIPHTHERIA,

---

Published January, 1883; Revised October, 1889; Revised April, 1891.

# ILLINOIS STATE BOARD OF HEALTH.

---

OFFICE OF THE BOARD,

SPRINGFIELD, APRIL, 1891.

*Health Officers, attending Physicians and heads of households in which DIPHTHERIA occurs, should carry out the Rules and Regulations contained in the following pages for the prevention and control of this most fatal disease.*

*Copies of this Circular should be furnished to the family in which the case may be, and also to neighboring families.*

*The Preventable-Disease Circulars of the Board may be obtained by addressing the Secretary.*

BY ORDER OF THE BOARD,

JOHN H. RAUCH,  
*Secretary,*

# DIPHTHERIA.

---

Diphtheria is a contagious disease: one that a well person can take from the sick. Like all contagious diseases Diphtheria is preventable. In order to prevent it we must know how it is carried from a sick to a well person.

Diphtheria may be taken:

1. By contact with the breath and discharges of a person sick with Diphtheria, and by breathing the air in the room of such a person; also by getting Diphtheria poison on sores.

2. From milk and other food tainted with Diphtheria poison.

To prevent the spread of Diphtheria all discharges from the bowels, nose and mouth of the sick person must be destroyed or made harmless as soon as they come from the patient; and the patient and all persons in the house must have pure air and pure water.

Diphtheria is specially fatal to children, but many grown people die of it. All the more care should be taken to prevent it, because when it breaks out it is very fatal and hard to treat with medicines. The following rules should be strictly followed whenever Diphtheria attacks any one:

## HOW TO PREVENT DIPHTHERIA.

1. Persons who have catarrh, or who are subject to sore throat are specially apt to catch Diphtheria. So are persons whose health is run down. Such persons should be very careful of themselves when Diphtheria is near them.

2. When there are cases of Diphtheria in a neighborhood keep away from meetings in crowded places, such as theatres, public halls, and even churches unless they are well aired and well heated during the services. Diphtheria is more common in winter and in cold months than at any other time, because there is less fresh air in houses in cold weather.

3. Nurseries, kindergartens, school rooms and other places where children go should have plenty of fresh air, and should be kept clean. Children catch Diphtheria more easily than grown people.

4. When there is a case of Diphtheria in the neighborhood do not neglect any sore throat, but call a physician at once.

5. Do not go into a house where there is a case of Diphtheria, and do not let your children play with children who live in that house.

6. Never let a person who has sore throat or Diphtheria breathe on your face. Do not kiss such a person, and do not eat with one.

7. If there is Diphtheria in your house do not eat or drink in the same room with the sick person, and do not use nor let any one else use the same cup, plate, glass, spoon, knife or fork used by the sick person.

8. Sometimes we cannot tell where the Diphtheria poison comes from unless from filth. The filth may be in a garbage heap, a cess-pool or a privy vault. It may be in the gases from a bad sewer, or from rotting vegetables in a cellar. It may be in water, or milk fouled by sewage or by water running into wells or springs from privies. All these things cause sickness.

9. Children must not be exposed to Diphtheria in any way. When grown people are obliged to go into the room of a person who has Diphtheria they should bathe and change their clothing before they go where children are.

10. Do not let children use a water closet or privy in which the discharges from Diphtheria patients are thrown. If you can do so, send the children away from the house where there is a case of Diphtheria.

11. Cats, dogs, cows, hogs, chickens, pigeons, canary birds, parrots and some other birds and animals sometimes have diphtheria and carry the disease. Keep the children away from any of these animals or birds which have any throat disease. Do not let any of them go into the room or house where a person is sick with Diphtheria.

12. There are no specifics, nor antidotes nor sure-cures for or medicines to prevent Diphtheria. It is a waste of time and money to buy or use anything of the kind.

#### DIRECTIONS FOR NURSING.

1. You can catch Diphtheria almost as easily as you can small-pox. When a person is first taken sick it is often hard to tell whether he has Diphtheria or not. To be on the safe side take it for granted that when any one has sore throat, foul breath and fever he has Diphtheria, especially if there is Diphtheria in the neighborhood. Separate this person from all others except the necessary nurses, and send for a physician.



*The Sick-Room.*—The room for a person sick with Diphtheria should be large, easily aired, and as far as possible from the rooms of other members of the family. Take out of the room all ornaments, carpets, table covers, draperies, plush chairs and other things that are not needed in it. The patient must have plenty of fresh air, night and day. If possible heat the room with an open fire. If there is a fire-place have a fire in it, even if you must use other heat. A stove makes the worst kind of heat for the sick-room. If a stove must be used, put a pan or kettle of water on it.

If you can do so place the bed near the centre of the room, without letting the air blow directly on the patient.

The discharges from the nose and mouth of the patient should be taken on clean rags and burned at once.

Keep in the chamber-pot about a quart of solution No. 2. When the patient has an operation from the bowels empty the vessel and then put more of the solution into it.

All knives, forks, spoons, glasses, cups and plates used by the patient must be put into boiling water at once.

A pail or tub of solution No. 3—two ounces to one gallon of water (p. 8)—should be kept in the room, and all clothing, blankets, sheets, towels, pillow slips and other cloth articles used about the patient or in the room should be put into this as soon as they are used, and before they are taken from the room. Then they must be taken out and boiled at once. Use old blankets on the bed.

If you can do so, employ a professional nurse for the patient. No more than two persons should go into the patient's room, and these persons should keep away from other members of the family. If one of these persons has to go away from the house he or she should change the clothing and wash the hands, face and hair with soap and water.

While there is Diphtheria in a house no one living in that house should get into any street car, omnibus, hack, steam car, steamboat or other public conveyance, or go to any public meeting, or into any crowded building, such as a theatre, church or school. They should not go into any of these places after the patient is well until the health authorities give permission.

Dogs, cats, birds and fowls should be kept out of the room, and even out of the house.

As long as anyone in a house has Diphtheria throw into the privy vault every day four or five gallons of solution No. 2. For water closets pour a quart of this solution into the pan after using it.

## CARE AFTER RECOVERY.

A person who has had a bad attack of Diphtheria can spread the disease for forty days from the beginning of the sickness. A person who has had Diphtheria should not associate with others, nor go to school or church or to any public meeting until the throat is entirely well and the sores on the lips and nose are healed. Before going to school or to any meeting the person should have a health certificate from the physician or health officer.

All the clothing of the sick person should be disinfected before it is worn again. The clothing the patient was wearing when he was taken sick should be disinfected at once and put away.

## REPORT TO THE HEALTH OFFICER.

Whenever a case of Diphtheria occurs in a house the head of the house or the attending physician should report it at once to the health authorities. Plain and distinct notices in the form of placards should be placed on the house or premises where there is a case of Diphtheria, and children should be kept away from such houses. Notices should be sent to all public schools in the neighborhood when there is Diphtheria in any house, and the pupils should be warned against visiting or playing about such houses.

When the health officer is notified of a case of Diphtheria he should go to the house and see that the necessary precautions are enforced. It is his duty to post placards, to notify schools, to take charge of the funeral of anyone that dies of the disease, to see that rooms, clothing and premises are properly disinfected, and to give official certificates of recovery, and that the person is no longer apt to spread the disease. Until the health authority gives such a certificate the house and everything in it should be quarantined. Where there is no health officer the attending physician should attend to these matters.

## IN CASE OF DEATH.

If a person dies of Diphtheria the body should be wrapped in a sheet thoroughly wet with solution No. 2, and placed in an air-tight coffin, which must be closed at once and kept in the sick-room until taken away for burial.

It is unlawful to hold a public funeral or wake over the body, or to put such a body on a railroad train.

## FUMIGATE AND CLEAN THE HOUSE.

After the patient gets well or dies all the clothes he has worn or used that cannot be washed, and the room and everything in it should be disinfected with burning sulphur. These are the directions for disinfecting a room with sulphur:

1. Paste strips or sheets of paper over the keyholes, window cracks, door cracks, fireplaces, stove holes and other openings. Have all windows and doors shut.

2. All the articles in the room that cannot be washed must be spread out on chairs or racks. Mattresses should be opened and set up on edge. Window shades and curtains spread out full length. If there is a trunk or chest in the room open it, but let nothing stay in it. Open the pillows so that the sulphur fumes can reach the feathers.

3. Use 3 pounds of sulphur for every 1,000 cubic feet in the room. A room 10 feet long, 10 feet wide and 10 feet high has 1,000 cubic feet. For a closet half as large use a pound and a half of sulphur. Moisten the sulphur with alcohol.

4. Take out of the room any wire mattress, sewing machine, piano or other machine made with metal. Sulphur fumes injure fine iron or steel.

5. Burn the sulphur in an iron vessel with live coals. Take a tub with about two inches of water in the bottom. Put some bricks in it. Then put the vessel with live coals on the bricks, moisten the sulphur with alcohol and throw it on the coals. When the sulphur begins to burn close the room tightly for 24 hours.

6. At the end of 24 hours open the windows, top and bottom, if you can, and air the room for a day or two.

7. Take out the clothes and other things that have been fumigated and put them in the sunshine and air for several days. Take up the carpet, have it beaten, and air it for about a week.

8. While the room is being aired, brush the walls and ceiling, and then scrub the paint, all wood-work and floors with lye soap and hot water.

It is safer to burn straw, husk, moss or "excelsior" mattress filling.

The outer clothing worn by those who have nursed the sick should be fumigated with sulphur. All clothing that can be washed should be boiled for at least one hour.

## BEST DISINFECTANTS.

For general use: Sunlight, fresh air, soap and water, thorough cleanliness,

For special purposes the following are good, simple and cheap. Any druggist can make them.

#### SOLUTION NO. 1.

*Dissolve 4 ounces of the best chloride of lime in one gallon of pure water, or half a pound to two gallons.*

Pour one quart of this into the vessel with each discharge of a Diphtheria patient, and leave it in the vessel for an hour before throwing it into the privy vault or water closet. Let the patient spit into a cup half-full of this solution.

This solution will bleach colored cloth. If this solution is offensive use solution No. 2 or 3.

#### SOLUTION NO. 2.

*Dissolve corrosive sublimate, permanganate of potash and muriate of ammonia in pure water in the proportion of half an ounce of each to two gallons of water.*

Use for the same purpose and in the same way as solution No. 1, but it takes longer. This solution is poisonous, and will injure lead pipes. It should not be made or kept in a metal vessel.

#### SOLUTION NO. 3.

*Dissolve four ounces of corrosive sublimate and one pound of sulphate of copper in one gallon of water.*

Use this for disinfecting clothing and bed clothes. Add a tea-cupful of it to two gallons of water. Soak the clothes in it for two hours, then wring out and boil them in a wash boiler. This solution is poisonous, and must not be put into metal vessels, nor poured into lead pipes.

#### DISINFECTION OF PRIVY VAULTS AND CESS-POOLS.

Use one gallon of Solution No. 3 to three gallons of water. Pour this over the contents of the vault and into the cess-pool. All parts of the vault and the wood work should be thoroughly wet with the solution. This should be done every day while the disease is in the house.

Solution No. 2 or 3 may be made by the barrel and kept in a safe place where children and animals cannot get at it.

[S. B. H. No. 157—5 m, 1-2, 1888.]

---

ILLINOIS STATE BOARD OF HEALTH.

---

# PREVENTABLE-DISEASE CIRCULAR.

---

*No. 3.-SCARLET FEVER.*

---

PUBLISHED FEBRUARY, 1883; REVISED, JANUARY, 1891.

# ILLINOIS STATE BOARD OF HEALTH.

---

OFFICE OF THE BOARD,

SPRINGFIELD, JANUARY, 1891.

*Health Officers, attending Physicians and heads of households in which SCARLET FEVER occurs, are enjoined to carry out the Rules and Regulations contained in the following pages for the prevention and control of this dangerous disease.*

*Copies of this Circular should be furnished not only to the family in which the case may be, but also to neighboring families which may be exposed.*

*The Preventable-Disease Circulars of the Board may be obtained by addressing the Secretary.*

BY ORDER OF THE BOARD,

JOHN H. RAUCH,  
*Secretary.*

## SCARLET FEVER.

—0—

SCARLET FEVER is, pre-eminently, the contagious disease of childhood. Although all ages are liable to the disease, the chances of attack rapidly diminish after the fifth year. This predisposition of childhood is attributed to the feeble resisting power of early life. For the same reason, the chances of recovery and of escape from its serious after-effects increase with the age of the individual.

These considerations should lead to especial care in guarding young children from danger of exposure to the contagion of Scarlet Fever. The common theory of too many mothers and nurses—that “the diseases of childhood are to be expected anyway; there is no use in attempting to guard children from their distinctive diseases;”—is mischievous in the extreme, and should be refuted by all sanitarians, health officers, and family physicians.

Because a certain class of diseases are more prevalent and more dangerous in early life, and grow less frequent and less fatal as the vigor and fullness of adult life are approached, would seem to be common-sense reasons why the infant and young child should be all the more carefully guarded against exposure to them\*—and this is especially true of the disease under consideration.

As in other contagious diseases, there are two important matters demanding attention in order to prevent the spread of Scarlet Fever. The first is to *isolate* the patient—to separate the sick from the well. The second is to destroy, at once and effectually, everything which comes from the body of the patient—before it can infect anything else, if possible; if not, then to subject everything likely to be infected to such treatment as will destroy the poisonous property.

The Scarlet Fever poison is contained in the breath and discharge of the patient, and especially in the skin which peels off at the close of the attack, and may be scattered through the air in tiny scales or powder. These particles may settle down in undusted corners, or lodge in clothing, carpets, bedding, etc.; and, as they retain their poisonous property for an indefinite period, may kindle an epidemic whenever dislodged to come in contact with susceptible subjects.

The instructions, which follow, with reference to the care of the sick, and especially those with reference to the means of destroying the poison, should be conscientiously carried out in every household where there is a case of Scarlet Fever. In a sanitary sense, every person is his brother's keeper where contagious disease is concerned. Concealment, or neglect of known necessary precautions, whereby contagion is spread, may be as murderous in effect, whatever the intent, as the club of Cain itself.

If the instructions here set forth were faithfully followed in every case of Scarlet Fever, for a comparatively brief space of time, its poison could be entirely eradicated,—and this scourge of childhood would soon cease to fill mothers' hearts with dread and anxiety.

---

\*Since one attack of Scarlet Fever usually suffices to prevent subsequent ones, the question has sometimes arisen as to the propriety of intentionally exposing children to the contagion during exceptionally mild epidemics of the disease. This is a question which must, in all cases, be decided by the family physician. And it should not be forgotten that even a mild case in one child may communicate a malignant attack to another.

## SCARLET FEVER—ITS PREVENTION AND CONTROL.

—o—

1. During the existence of Scarlet Fever in a community, all cases of sore throat, with fever, are to be looked upon with suspicion until their innocent character is established.

2. If a child, who has not previously had an attack of Scarlet Fever, should unfortunately be exposed to a case, it should be carefully watched during the following two weeks. Upon the first symptoms of shivering, lassitude, headache, frequent pulse, hot, dry skin, flushed face, furred tongue, with much thirst and loss of appetite, the child should immediately be separated as completely as possible from other members of the household and all other persons, until a physician has seen it and determined whether it has Scarlet Fever. All persons known to be sick with this disease (even those but mildly sick) should be promptly and thoroughly isolated from the public. This is of quite as much importance as in a case of small-pox.

3. As soon as it is determined that the disease is Scarlet Fever, the following precautions should be scrupulously carried out. These are substantially the same as already recommended by the STATE BOARD OF HEALTH, in the Circulars on Small-Pox and Diphtheria:

*The Sick-Room.*—The room selected for the sick should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not absolutely needed in the room, should be removed. A free circulation of air from without should be admitted both by night and day—there is no better disinfectant than pure air. Place the bed as near as possible in the middle of the room; but care should, of course, be taken to keep the patient out of draughts. In cold weather, whenever it is possible, there should be an open fire in the sick-room. An open fire is the best ventilation for a room in cold weather, and it should be used for the sick-room even when register or steam heat is used.

If the room connects with others which *must be occupied*, lock all but one door for entrance and exit to the sick room, and fasten to the door frames—top, bottom and sides—sheets of cheap cotton cloth, kept wet with Standard Solution No. 2 (see page 7). Over the door to be used, the sheet must not be tacked at the bottom nor along the full length of the lock-side of the frame, but about five feet may be left free to be pushed aside; this sheet however, must be long enough to allow ten or twelve inches to lie in folds on the floor, and must, also be kept wet with the disinfectant.

*Precaution in the Sick Room.*—All discharges from the nose and mouth of the patient should be received on rags and immediately burned. Night-vessels should be kept supplied with a quart or so of Standard Solution No. 2, into which all discharges should be received. All spoons, dishes, etc., used or taken from the sick room, should be put in boiling water at once.

A pail or tub of Standard Solution No. 3—two ounces to a gallon of water—(see page 7) should be kept in the sick room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be well boiled as soon as practicable.

*Attendants.*—Not more than two persons—one of them a skillful professional nurse, if possible—should be employed in the sick room, and their intercourse with other members of the family should be as much restricted as possible.

In the event that it becomes necessary for an attendant to go away from the house a complete change of clothing should be made, using such as has not been exposed to infec-



tion; the hands, face and hair should be washed in Standard Solution No. 1—one part to three parts of water or one part of chlorinated soda (liquor sodæ chlorinatæ) diluted with nine parts of water.

*Miscellaneous.*—No inmate of the house, during the continuance of the disease, should venture into any public conveyance, or assemblage, or crowded building, such as a church or school; nor, after its termination, until permission is given by the health authorities.

Letters must not be sent from the patient, and all mail matter from the house should first be subjected to a dry heat of 250-260 deg. F.

Domestic animals, dogs, cats, etc., should not be allowed to enter the room of the patient, or, better still, should be excluded from the house.

During the entire illness the privy should be thoroughly disinfected with Standard Solution No. 2, four or five gallons of which should be thrown into the vault every day. Water-closets should be disinfected by pouring a quart or so of this disinfectant into the receiver after each use.

*Care after Recovery.*—There is danger of communicating the disease directly, from one recovering from Scarlet Fever, so long as there is any soreness of the eyes, nose or air-passages; or any symptom of dropsy: but, more especially, so long as the skin continues to peel off. Although the latter process is usually completed within about forty days from the beginning of the sickness, cases happen, sometimes, when it last even seventy or eighty days. No matter how long this period may be, the child should be considered dangerous until all scaling or peeling of the skin has ceased. Vaseline, cosmoline, olive oil or lard should be used, in the discretion of the attending physician, to anoint the skin, in order to prevent the scales from being scattered about and so spreading the contagion.

When recovery is complete, and the skin smooth and free from scales, the child should be bathed all over, at least twice or oftener, and the hair thoroughly washed each time, before being allowed to leave the house. This bathing should be under the direction of the family physician, at such times and in such manner as he thinks prudent. The addition of a gill of thymol water to each gallon of the bath is recommended.

4. No person after recovering should appear in public wearing the same clothing worn while sick or recovering from Scarlet Fever, until such clothing has been thoroughly disinfected, and this without regard to the time which has elapsed since recovery. Nor should a person from premises in which there is or has been a case of Scarlet Fever attend any school, Sunday school, church, or public assembly, or be permitted by the health authorities or by the school board to do so, until after disinfection of such premises and of the clothing worn by such person if it has been exposed to the contagion of the disease.

5. Cases of Scarlet Fever should be promptly reported to the proper health authority, either by the attending physicians or by the householders. Plain and distinct notices, in the form of placards, should be placed upon the house or premises where there is a case of Scarlet Fever, and children, especially, should not be allowed to enter such house. Notice should also be given to all public schools, of the locality of any house in which there is Scarlet Fever, and the scholars should be cautioned against visiting or playing on the infected premises.

6. Immediately upon receipt of notice of the existence of a case of Scarlet Fever, the health officer should visit the locality and secure prompt compliance with the precautions above set forth. He should see that the proper placards are duly posted; should notify the schools; take charge of funerals of those dying of this disease; superintend the disinfection of rooms, clothing and premises; and, finally, give official certificates of recovery, and of freedom from liability to communicate the disease to others. Until these latter are issued a rigid system of isolation or quarantine should be maintained with regard to an infected house and its contents—persons and things.

Where there is no health officer, the attending physician should see that the above precautions are carried out.

7. In the event of death, the body should be wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in one of the Standard Solutions, No. 1 or 2,) and placed in an airtight coffin, *which is to remain in the sick-room until removed for burial.* No public funeral should be allowed either at the house or church, and no more persons should be permitted to go to the cemetery than are necessary to inter the corpse.

8. After recovery or death all articles worn by, or that have come in contact with the patient, together with the room and its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fire-places, flues, key-holes, doors and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three pounds of sulphur for every 1,000 cubic feet of space in the room. (The sulphur should be thoroughly moistened with alcohol.) Closets opening into the room should have proportionate quantities of sulphur burned in them at the same time. All articles in the room and others of every description that have been exposed to infection, which cannot be washed or subjected to dry heat, and are yet too valuable to be burned, must be spread out on chairs or racks; mattresses or spring-beds set up so as to have both surfaces exposed; window shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should then be kept tightly closed for twenty-four hours.

The object of disinfection in the sick room is, mainly, the destruction of infectious materials attached to surfaces, or deposited as dust upon window ledges, mouldings, door frames, in crevices, etc. If the room was properly cared for and ventilated during the sickness, and especially if it was stripped of carpets, curtains and unnecessary furniture at the beginning, the difficulties of disinfection will be greatly reduced.

After the sulphur fumigation, all surfaces should be thoroughly washed with Standard Solution No. 1, diluted with three parts of water, or with 1-1000 solution of corrosive sublimate; or with Standard Solution No. 2, four ounces to the gallon of water. Walls and ceilings, if plastered, should be brushed over with one of these solutions and then lime-washed; if papered, the paper should be removed and the exposed surfaces then brushed over with the solution.

Especial care must be taken to wash away all dust from every part of the room, and to apply the solution liberally to crevices and out-of-the-way places where dust may settle. After such application of the disinfectant, open doors and windows for twenty-four hours, and then scrub all wood work, floors, etc., with soap and hot water.

The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable, it should be removed from the room at the beginning of the illness.

After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible for a week or two. Where houses are isolated, articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article *it should be destroyed.*

All this work should be done—both the disinfection and the destruction of property—under the direct supervision of the local authorities.

9. Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the Standard Solution No. 3—two ounces to the gallon of water; they should then be immediately and thoroughly boiled for at least half an hour. The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or "excelsior" filling. The clothing of the nurses should be thoroughly fumigated and disinfected before it is taken from the house, or, better still, burned, if feasible.

## BEST DISINFECTANTS.

Sunlight, fresh air, soap and water, thorough cleanliness—for general use.

Nor special purposes the following are the most efficient, the simplest and the cheapest:

### STANDARD SOLUTION NO. 1

*Dissolve Chloride of Lime of the best quality in pure water, in the proportion of four ounces (a quarter of a pound) to the gallon.*

One quart of this solution for each discharge in scarlet or typhoid fever or other contagious or infectious disease. Mix well and leave in vessel for an hour or more before throwing into privy vault or water closet. The same for vomited matter. For every copious discharge, especially in cholera, use a larger quantity; and for solid or semi-solid matter use the solution in double strength. Discharges from the mouth and throat should be received into a cup half full of the solution, and those from the nostrils upon soft cotton or linen rag, which should be immediately burned.

Good chloride of lime may be purchased by the quantity at  $3\frac{1}{2}$  cents per pound—making the cost of this solution less than one cent a gallon.

### STANDARD SOLUTION NO. 2.

*Dissolve Corrosive Sublimate and Permanganate of Potash in pure water, in the proportion of two drachms of each to the gallon.*

Use for the same purposes and in the same way as No. 1. Equally effective, but slower in its action, so that it is necessary to let the mixture (disinfectant and infected material) stand about four hour before disposing of it. It is best to empty the mixture into a wooden pail and leave it for twenty-four hours, when it may be thrown into the vault or water closet, or into a hole dug in the ground for that purpose, in some suitable spot. This solution is odorless, while the chloride of lime solution is often objectionable in the sick room on account of its smell.

No. 2 is highly poisonous, and will injure lead pipes if passed through them in large quantities.

Corrosive sublimate costs about 70 cents, and permanganate of Potash about 65 cents by the single pound—making the cost of No. 2 a little more than two cents a gallon.

### STANDARD SOLUTION NO. 3.

*Dissolve four ounces of Corrosive Sublimate and one pound of Sulphate of Copper in one gallon of water.*

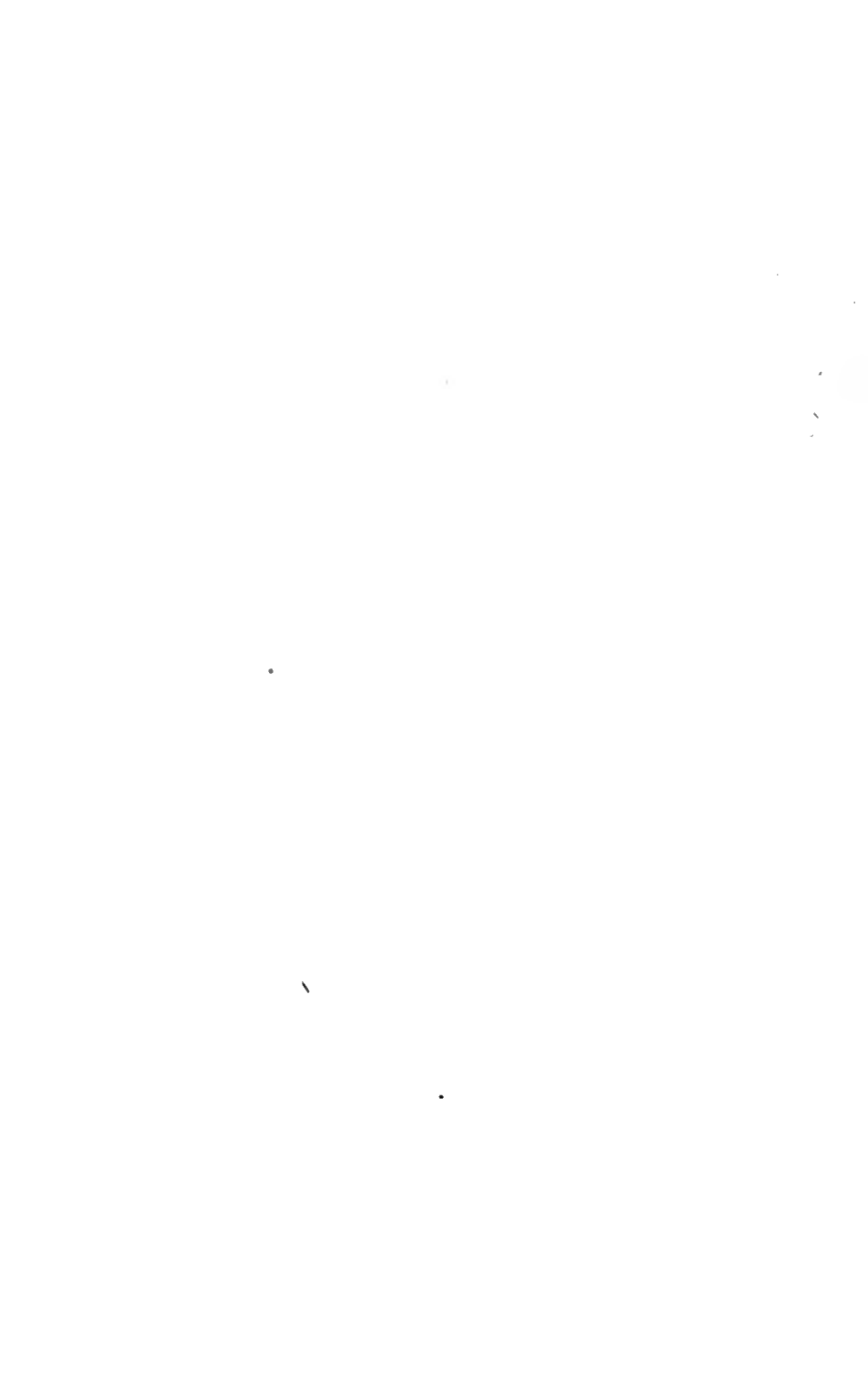
Two ounces of this solution to the gallon of water for the disinfection of clothing. Articles to be disinfected should be soaked in the dilute solution at least two hours, then wrung out and sent to the wash boiler. When diluted as directed, this solution may be used without danger; a poisonous dose could scarcely be swallowed by mistake, owing to the metallic taste and the large quantity necessary to produce a fatal result.

*N. B.*—Solutions of Corrosive Sublimate should not be made or kept in metal vessels. A wooden tub, barrel or pail or an earthen jar should be used for such solutions.

*Disinfection of Privy Vaults, Cesspools, etc.*—When the excreta or discharge (not previously disinfected) of patients suffering with any contagious disease have been thrown into a vault this becomes infected and dangerous. Disinfection should be resorted to as soon as the fact is discovered or even suspected.

Solution No. 3, diluted one part to three of water, may be used in the proportion of one gallon of the dilute solution to every four gallons (estimated) of the contents of the vault. All exposed portions of the vault, and wood work, should be thoroughly wet with the solution.

To keep a vault disinfected during the progress of an epidemic—or even a single case of contagious disease—sprinkle chloride of lime freely over its contents daily. Or if the odor of chlorine be objectionable apply daily four or five gallons of Solution No. 2, which should be made up by the barrel, and kept in a convenient place for this purpose.



[S. B. H. No. 157-5 m, 1-2, 1888.]

---

ILLINOIS STATE BOARD OF HEALTH.

---

# PREVENTABLE-DISEASE CIRCULAR.

---

*No. 3.-SCARLET FEVER.*

---

PUBLISHED FEBRUARY, 1883; REVISED, JANUARY, 1891.

# ILLINOIS STATE BOARD OF HEALTH.

---

OFFICE OF THE BOARD,

SPRINGFIELD, JANUARY, 1891.

*Health Officers, attending Physicians and heads of households in which SCARLET FEVER occurs, are enjoined to carry out the Rules and Regulations contained in the following pages for the prevention and control of this dangerous disease.*

*Copies of this Circular should be furnished not only to the family in which the case may be, but also to neighboring families which may be exposed.*

*The Preventable-Disease Circulars of the Board may be obtained by addressing the Secretary.*

BY ORDER OF THE BOARD,

JOHN H. RAUCH,  
*Secretary.*

## SCARLET FEVER.

—o—

SCARLET FEVER is, pre-eminently, the contagious disease of childhood. Although all ages are liable to the disease, the chances of attack rapidly diminish after the fifth year. This predisposition of childhood is attributed to the feeble resisting power of early life. For the same reason, the chances of recovery and of escape from its serious after-effects increase with the age of the individual.

These considerations should lead to especial care in guarding young children from danger of exposure to the contagion of Scarlet Fever. The common theory of too many mothers and nurses—that “the diseases of childhood are to be expected anyway; there is no use in attempting to guard children from their distinctive diseases;”—is mischievous in the extreme, and should be refuted by all sanitarians, health officers, and family physicians.

Because a certain class of diseases are more prevalent and more dangerous in early life, and grow less frequent and less fatal as the vigor and fullness of adult life are approached, would seem to be common-sense reasons why the infant and young child should be all the more carefully guarded against exposure to them\*—and this is especially true of the disease under consideration.

As in other contagious diseases, there are two important matters demanding attention in order to prevent the spread of Scarlet Fever. The first is to *isolate* the patient—to separate the sick from the well. The second is to destroy, at once and effectually, everything which comes from the body of the patient—before it can infect anything else, if possible; if not, then to subject everything likely to be infected to such treatment as will destroy the poisonous property.

The Scarlet Fever poison is contained in the breath and discharge of the patient, and especially in the skin which peels off at the close of the attack, and may be scattered through the air in tiny scales or powder. These particles may settle down in undusted corners, or lodge in clothing, carpets, bedding, etc.; and, as they retain their poisonous property for an indefinite period, may kindle an epidemic whenever dislodged to come in contact with susceptible subjects.

The instructions, which follow, with reference to the care of the sick, and especially those with reference to the means of destroying the poison, should be conscientiously carried out in every household where there is a case of Scarlet Fever. In a sanitary sense, every person is his brother's keeper where contagious disease is concerned. Concealment, or neglect of known necessary precautions, whereby contagion is spread, may be as murderous in effect, whatever the intent, as the club of Cain itself.

If the instructions here set forth were faithfully followed in every case of Scarlet Fever, for a comparatively brief space of time, its poison could be entirely eradicated,—and this scourge of childhood would soon cease to fill mothers' hearts with dread and anxiety.

---

\*Since one attack of Scarlet Fever usually suffices to prevent subsequent ones, the question has sometimes arisen as to the propriety of intentionally exposing children to the contagion during exceptionally mild epidemics of the disease. This is a question which must, in all cases, be decided by the family physician. And it should not be forgotten that even a mild case in one child may communicate a malignant attack to another.

## SCARLET FEVER—ITS PREVENTION AND CONTROL.



1. During the existence of Scarlet Fever in a community, all cases of sore throat, with fever, are to be looked upon with suspicion until their innocent character is established.

2. If a child, who has not previously had an attack of Scarlet Fever, should unfortunately be exposed to a case, it should be carefully watched during the following two weeks. Upon the first symptoms of shivering, lassitude, headache, frequent pulse, hot, dry skin, flushed face, furred tongue, with much thirst and loss of appetite, the child should immediately be separated as completely as possible from other members of the household and all other persons, until a physician has seen it and determined whether it has Scarlet Fever. All persons known to be sick with this disease (even those but mildly sick) should be promptly and thoroughly insulated from the public. This is of quite as much importance as in a case of small-pox.

3. As soon as it is determined that the disease is Scarlet Fever, the following precautions should be scrupulously carried out. These are substantially the same as already recommended by the STATE BOARD OF HEALTH, in the Circulars on Small-Pox and Diphtheria:

*The Sick-Room.*—The room selected for the sick should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not absolutely needed in the room, should be removed. A free circulation of air from without should be admitted both by night and day—there is no better disinfectant than pure air. Place the bed as near as possible in the middle of the room; but care should, of course, be taken to keep the patient out of draughts. In cold weather, whenever it is possible, there should be an open fire in the sick-room. An open fire is the best ventilation for a room in cold weather, and it should be used for the sick-room even when register or steam heat is used.

If the room connects with others which *must be occupied*, lock all but one door for entrance and exit to the sick room, and fasten to the door frames—top, bottom and sides—sheets of cheap cotton cloth, kept wet with Standard Solution No. 2 (see page 7). Over the door to be used, the sheet must not be tacked at the bottom nor along the full length of the lock-side of the frame, but about five feet may be left free to be pushed aside; this sheet however, must be long enough to allow ten or twelve inches to lie in folds on the floor, and must, also be kept wet with the disinfectant.

*Precaution in the Sick Room.*—All discharges from the nose and mouth of the patient should be received on rags and immediately burned. Night-vessels should be kept supplied with a quart or so of Standard Solution No. 2, into which all discharges should be received. All spoons, dishes, etc., used or taken from the sick room, should be put in boiling water at once.

A pail or tub of Standard Solution No. 3—two ounces to a gallon of water—(see page 7) should be kept in the sick room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be well boiled as soon as practicable.

*Attendants.*—Not more than two persons—one of them a skillful professional nurse, if possible—should be employed in the sick room, and their intercourse with other members of the family should be as much restricted as possible.

In the event that it becomes necessary for an attendant to go away from the house a complete change of clothing should be made, using such as has not been exposed to infec-



tion; the hands, face and hair should be washed in Standard Solution No. 1—one part to three parts of water or one part of chlorinated soda (liquor sodæ chlorinatæ) diluted with nine parts of water.

*Miscellaneous.*—No inmate of the house, during the continuance of the disease, should venture into any public conveyance, or assemblage, or crowded building, such as a church or school; nor, after its termination, until permission is given by the health authorities.

Letters must not be sent from the patient, and all mail matter from the house should first be subjected to a dry heat of 250-260 deg. F.

Domestic animals, dogs, cats, etc., should not be allowed to enter the room of the patient, or, better still, should be excluded from the house.

During the entire illness the privy should be thoroughly disinfected with Standard Solution No. 2, four or five gallons of which should be thrown into the vault every day. Water-closets should be disinfected by pouring a quart or so of this disinfectant into the receiver after each use.

*Care after Recovery.*—There is danger of communicating the disease directly, from one recovering from Scarlet Fever, so long as there is any soreness of the eyes, nose or air-passages; or any symptom of dropsy: but, more especially, so long as the skin continues to peel off. Although the latter process is usually completed within about forty days from the beginning of the sickness, cases happen, sometimes, when it last even seventy or eighty days. No matter how long this period may be, the child should be considered dangerous until all scaling or peeling of the skin has ceased. Vaseline, cosmoline, olive oil or lard should be used, in the discretion of the attending physician, to anoint the skin, in order to prevent the scales from being scattered about and so spreading the contagion.

When recovery is complete, and the skin smooth and free from scales, the child should be bathed all over, at least twice or oftener, and the hair thoroughly washed each time, before being allowed to leave the house. This bathing should be under the direction of the family physician, at such times and in such manner as he thinks prudent. The addition of a gill of thymol water to each gallon of the bath is recommended.

4. No person after recovering should appear in public wearing the same clothing worn while sick or recovering from Scarlet Fever, until such clothing has been thoroughly disinfected, and this without regard to the time which has elapsed since recovery. Nor should a person from premises in which there is or has been a case of Scarlet Fever attend any school, Sunday school, church, or public assembly, or be permitted by the health authorities or by the school board to do so, until after disinfection of such premises and of the clothing worn by such person if it has been exposed to the contagion of the disease.

5. Cases of Scarlet Fever should be promptly reported to the proper health authority, either by the attending physicians or by the householders. Plain and distinct notices, in the form of placards, should be placed upon the house or premises where there is a case of Scarlet Fever, and children, especially, should not be allowed to enter such house. Notice should also be given to all public schools, of the locality of any house in which there is Scarlet Fever, and the scholars should be cautioned against visiting or playing on the infected premises.

6. Immediately upon receipt of notice of the existence of a case of Scarlet Fever, the health officer should visit the locality and secure prompt compliance with the precautions above set forth. He should see that the proper placards are duly posted; should notify the schools; take charge of funerals of those dying of this disease; superintend the disinfection of rooms, clothing and premises; and, finally, give official certificates of recovery, and of freedom from liability to communicate the disease to others. Until these latter are issued a rigid system of isolation or quarantine should be maintained with regard to an infected house and its contents—persons and things.

Where there is no health officer, the attending physician should see that the above precautions are carried out.

7. In the event of death, the body should be wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in one of the Standard Solutions, No. 1 or 2,) and placed in an airtight coffin, which is to remain in the sick-room until removed for burial. No public funeral should be allowed either at the house or church, and no more persons should be permitted to go to the cemetery than are necessary to inter the corpse.

8. After recovery or death all articles worn by, or that have come in contact with the patient, together with the room and its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fire-places, flues, key-holes, doors and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three pounds of sulphur for every 1,000 cubic feet of space in the room. (The sulphur should be thoroughly moistened with alcohol.) Closets opening into the room should have proportionate quantities of sulphur burned in them at the same time. All articles in the room and others of every description that have been exposed to infection, which cannot be washed or subjected to dry heat, and are yet too valuable to be burned, must be spread out on chairs or racks; mattresses or spring-beds set up so as to have both surfaces exposed; window shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should then be kept tightly closed for twenty-four hours.

The object of disinfection in the sick room is, mainly, the destruction of infectious materials attached to surfaces, or deposited as dust upon window ledges, mouldings, door frames, in crevices, etc. If the room was properly cared for and ventilated during the sickness, and especially if it was stripped of carpets, curtains and unnecessary furniture at the beginning, the difficulties of disinfection will be greatly reduced.

After the sulphur fumigation, all surfaces should be thoroughly washed with Standard Solution No. 1, diluted with three parts of water, or with 1-1000 solution of corrosive sublimate; or with Standard Solution No. 2, four ounces to the gallon of water. Walls and ceilings, if plastered, should be brushed over with one of these solutions and then lime-washed; if papered, the paper should be removed and the exposed surfaces then brushed over with the solution.

Especial care must be taken to wash away all dust from every part of the room, and to apply the solution liberally to crevices and out-of-the-way places where dust may settle. After such application of the disinfectant, open doors and windows for twenty-four hours, and then scrub all wood work, floors, etc., with soap and hot water.

The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable, it should be removed from the room at the beginning of the illness.

After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible for a week or two. Where houses are isolated, articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article it should be destroyed.

All this work should be done—both the disinfection and the destruction of property—under the direct supervision of the local authorities.

9. Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the Standard Solution No. 3—two ounces to the gallon of water; they should then be immediately and thoroughly boiled for at least half an hour. The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or "excelsior" filling. The clothing of the nurses should be thoroughly fumigated and disinfected before it is taken from the house, or, better still, burned, if feasible.

## BEST DISINFECTANTS.

Sunlight, fresh air, soap and water, thorough cleanliness—for general use.

Nor special purposes the following are the most efficient, the simplest and the cheapest:

## STANDARD SOLUTION NO. 1

*Dissolve Chloride of Lime of the best quality in pure water, in the proportion of four ounces (a quarter of a pound) to the gallon.*

One quart of this solution for each discharge in scarlet or typhoid fever or other contagious or infectious disease. Mix well and leave in vessel for an hour or more before throwing into privy vault or water closet. The same for vomited matter. For every copious discharge, especially in cholera, use a larger quantity; and for solid or semi-solid matter use the solution in double strength. Discharges from the mouth and throat should be received into a cup half full of the solution, and those from the nostrils upon soft cotton or linen rag, which should be immediately burned.

Good chloride of lime may be purchased by the quantity at  $3\frac{1}{2}$  cents per pound—making the cost of this solution less than one cent a gallon.

## STANDARD SOLUTION NO. 2.

*Dissolve Corrosive Sublimate and Permanganate of Potash in pure water, in the proportion of two drachms of each to the gallon.*

Use for the same purposes and in the same way as No. 1. Equally effective, but slower in its action, so that it is necessary to let the mixture (disinfectant and infected material) stand about four hour before disposing of it. It is best to empty the mixture into a wooden pail and leave it for twenty-four hours, when it may be thrown into the vault or water closet, or into a hole dug in the ground for that purpose, in some suitable spot. This solution is odorless, while the chloride of lime solution is often objectionable in the sick room on account of its smell.

No. 2 is highly poisonous, and will injure lead pipes if passed through them in large quantities.

Corrosive sublimate costs about 70 cents, and permanganate of Potash about 65 cents by the single pound—making the cost of No. 2 a little more than two cents a gallon.

## STANDARD SOLUTION NO. 3.

*Dissolve four ounces of Corrosive Sublimate and one pound of Sulphate of Copper in one gallon of water.*

Two ounces of this solution to the gallon of water for the disinfection of clothing. Articles to be disinfected should be soaked in the dilute solution at least two hours, then wrung out and sent to the wash boiler. When diluted as directed, this solution may be used without danger; a poisonous dose could scarcely be swallowed by mistake, owing to the metallic taste and the large quantity necessary to produce a fatal result.

*N. B.*—Solutions of Corrosive Sublimate should not be made or kept in metal vessels. A wooden tub, barrel or pail or an earthen jar should be used for such solutions.

*Disinfection of Privy Vaults, Cesspools, etc.*—When the excreta or discharge (not previously disinfected) of patients suffering with any contagious disease have been thrown into a vault this becomes infected and dangerous. Disinfection should be resorted to as soon as the fact is discovered or even suspected.

Solution No. 3, diluted one part to three of water, may be used in the proportion of one gallon of the dilute solution to every four gallons (estimated) of the contents of the vault. All exposed portions of the vault, and wood work, should be thoroughly wet with the solution.

To keep a vault disinfected during the progress of an epidemic—or even a single case of contagious disease—sprinkle chloride of lime freely over its contents daily. Or if the odor of chlorine be objectionable apply daily four or five gallons of Solution No. 2, which should be made up by the barrel, and kept in a convenient place for this purpose.



[S. B. H. No. 158.—20m.—2-17-'89]

---

ILLINOIS STATE BOARD OF HEALTH.

---

PREVENTABLE-DISEASE CIRCULARS.

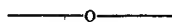
---

*No. 4.--TYPHOID FEVER.*

---

*WHEN it is considered that, one year with another, over 2,000 people die annually in the State of Illinois from Typhoid Fever; that upwards of 14,000 more are disabled by it for an average period of three months each; that these persons are taken from all classes of the community, and at all ages between 5 and 40 years—a large proportion during the productive or self-sustaining period; and when it is further considered that the disease is believed, on the one hand, to be as communicable as small-pox or measles, and, on the other, is asserted to be “altogether and easily preventable,” the duty of health officers, sanitarians and medical men, with reference to its suppression, would seem too obvious to need further emphasis or explanation.*

## TYPHOID FEVER.



TYPHOID FEVER has been fitly termed "the type of the filth-diseases." Without reference to the question whether it may originate in, or be caused by, the gases and other products of putrid animal matter, its prevalence unquestionably bears a constant relation to the condition of the sanitary surroundings.

Where there is a polluted water-supply; where there is undrained ground, contaminated with excremental filth; where foul, over-flowing or leaky privy-vaults soak the earth for rods with their contents; where defective, unventilated sewers and "skin" plumbing abound, there does Typhoid Fever find its most numerous victims.

From such localities the contagion, finding its way by various unsuspected channels, may invade the most cleanly and carefully-ordered household. The frequent mode by which it is spread is through the water-supply. A small quantity of the infectious matter of the disease is sufficient to poison the contents of a well or cistern, and thus to give rise to an outbreak among the susceptible who depend upon such source of supply. Or this water may, as has frequently been proved, be used for dairy purposes, and so introduce the infection into families, supplied with milk from such dairy, miles away from the source of danger.

The poison of Typhoid Fever exists, principally, in the discharges from the bowels of those suffering with the disease; and so well has the deadly character of such discharges been established, that attempts have been made to secure legislation enforcing the compulsory disinfection of the intestinal evacuations of all Typhoid-Fever patients. This is, of course, impracticable; and whatever is done in this direction to limit the prevalence of the disease, can only be accomplished through the spread of knowledge concerning its character and mode of diffusion. In this work boards of health can do little unaided by the Family Physician. Upon him rests the responsibility of seeing that thorough disinfection is carried out in every case of Typhoid Fever he may be called to treat.

To assist in the discharge of this responsibility, the following memorandum, concerning the sanitary aspects of Typhoid Fever, and the instructions as to disinfection, etc., have been prepared, and are published in the hope of making more effective the efforts to restrict the spread of a disease which so eminent an authority as Dr. Parkes has pronounced "altogether and easily preventable."

# TYPHOID FEVER:

## ITS SANITARY FEATURES—PREVENTION OF ITS SPREAD.

### I—ITS SANITARY FEATURES.

1. For sanitary purposes, Typhoid Fever is a contagious disease. Its specific poison will produce the same disease if introduced into the system of a susceptible healthy individual.

2. Like small-pox, scarlet fever, and many other contagious diseases, one attack of Typhoid Fever, as a rule, protects from subsequent attacks.

3. The specific poison of Typhoid Fever is contained in the diarrheal discharges (and, possibly, in other excretions and the exhalations,) of the patient. If these obtain access to a water-supply, or to articles of food or drink, an outbreak of Typhoid will follow among those partaking of such water or food. Repeated instances of this kind have been traced to the use of water from an infected well and to infected milk.

4. The diarrheal discharges, when dry, may preserve the poison as effectually as the crusts of small-pox, the scales of scarlet fever, and the dried membrane of diphtheria, preserve the specific poisons of those diseases.

5. These discharges, coming into contact with putrid animal matter, as by being thrown into water-closets and privies, are capable of saturating such matter with the Typhoid-Fever poison in its most concentrated and virulent form.

6. Typhoid Fever may, therefore, be propagated in either of the following ways: (*a*) By poisoning the water-supply through direct access of the discharges, or by their percolation through the soil. (*b*) By the ærial dissemination of the poison in dried particles of discharges or other excretions. (*c*) By exhalations from sewers, water-closets, privies, or other receptacles of these discharges.—By modes (*a*) and (*b*), articles of diet, both liquid and solid, may be contaminated, and thus give rise to outbreaks of the disease.

7. From the foregoing the deduction is obvious that the important sanitary indication, during the existence of a case of Typhoid Fever, is to subject the intestinal discharges and other excretions of the patient, to such process of disinfection as will destroy the specific poison contained, and to do this promptly and efficiently.

### II—PREVENTION OF ITS SPREAD.

1. When a case of Typhoid Fever is known to exist in a neighborhood, strict examination should be made regarding the surroundings and character of the water-supply of the locality. If there be any reason to suspect that this may be possibly contaminated from the case, its use should be forbidden until the proper measures can be taken to protect it against such contamination, and the question of its safety



be definitely settled. The location of wells, with reference to the privy into which Typhoid discharges are thrown, the inclination of the ground between such points, and the character of the soil, should all be taken into consideration. Wells into which surface-washings from the infected premises might find their way by the natural slope of the ground, and wells within a given distance of the privy of such premises, should be at once abandoned. The contaminating distance varies according to the nature of the soil and the depth of the well; in a loose, porous soil, a well 30 to 40 feet deep will be dangerous if within 100 feet of Typhoid premises.

2. If the case exists in a sewered neighborhood, every householder whose premises connect with a sewer in common with the infected house, should have a thorough inspection made of the drainage of his own premises. If the sewer connection be not broken by a proper ventilating shaft, extending above the highest point of the roof, such shaft should be provided forthwith. All interior plumbing should be examined, defective joints repaired, traps put in order, and the flushing devices of water-closets made effective.

3. Scrupulous cleanliness in every portion of the premises should be enforced. All decaying animal and vegetable matter, and every kind and source of filth in and around the house should be removed, and disinfectants be freely used. Surface drains and gutters, areas, outhouses, privies, shelters for domestic animals, fowls, etc., should receive close and constant attention, and the *Copperas Disinfectant* (see page 8) be used freely and regularly in every such place.

4. The precautions recommended to prevent the extension of the infection to other localities, are of even more importance upon the premises where a case of Typhoid Fever exists. Here there is the greatest danger of the poison finding lodgment in the soil which favors its growth and intensity, namely, filth in any form. Therefore, the advice given in No. 3 should be rigidly carried out, in its every detail, upon the infected premises.

5. Within the infected house itself the important matter to attend to is the prompt disinfection of the discharges from the patient, and of every thing liable to come in contact with such discharges. The following details should be observed:

(a) All discharges should be received in vessels containing a quart or so of the *Zinc Disinfectant* (see page 8) or a gill of a concentrated (5 per cent.) solution of chloride of zinc. (b) If there be a water-closet, this should be used exclusively for the discharges from the patient while the fever lasts, and the receptacle should be flooded three or four times a day with the *Zinc Disinfectant*. (c) When practicable—instead of being thrown into a privy—the discharges, after being thoroughly disinfected, should be buried in the ground, at least 100 feet away from any well or other source of water-supply. (d) The pail or tub of the *Zinc Disinfectant* should be kept in the sick-room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room, should be dropped immediately after use, and before being removed from the room. They should then be well boiled as soon as practicable. Rags, closet-paper, or other material used about the person of the patient, should be immediately burned. (e) The sick-room should be large, easily ventilated, and as far from the living and sleeping-rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not abso-

lutely needed in the room should be removed. A free circulation of air from without should be admitted both by night and day—there is no better disinfectant than pure aid. Place the bed as near as possible in the middle of the room; but keep the patient out of draughts. (f) Not more than two persons, one of them a skillful, professional nurse, if obtainable, should be employed in the sick-room, and their intercourse with other members of the family should be properly restricted. If possible, the attendants should be selected from those who have already had Typhoid Fever. In the event that it becomes necessary for an attendant to go away from the house, a change of clothing should be made, using such as has not been exposed to infection; the hands, face and hair should be washed in thymol water, or chloride of zinc solution—half an ounce of chloride of zinc to one gallon of water.

6. After recovery, or during convalescence, the patient is to be considered dangerous so long as the intestinal discharges continue to be more copious, liquid and frequent than natural; and disinfection should be maintained until the attending physician advises that it is no longer necessary.

7. In the event of death, the clothing in which the body is attired should be sprinkled with thymol water, the body wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in the *Zinc Disinfectant, double strength*), and placed in an airtight coffin, *which is to remain in the sick-room until removed for burial*. Public funerals are not advisable.

8. After recovery or death, all articles worn by, or that have come in contact with the patient, together with the room and all its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fire-places, flues, key-holes, doors, and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three or four pounds of sulphur. All articles in the room and others of every description that have been exposed to infection, which can not be washed or subjected to dry heat, and are yet too valuable to be burned, must be spread out on chairs or racks; mattresses or spring-beds set up so as to have both surfaces exposed; window-shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should be kept tightly closed \*or twenty-four hours. After this fumigation—which it will do no harm to repeat—the floor and wood-work should be washed with soap and hot water, the walls and ceiling white-washed, or, if papered, the paper should be removed. The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten, and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but, whenever practicable, it should be removed from the room at the beginning of the illness.

After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible for a week or two. Where

houses are isolated, articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article *it should be destroyed*.

All this work should be done—both the disinfection and the destruction of property—under the direct supervision of the local authorities or attending physician.

9. Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the *Zinc Disinfectant*; they should then be immediately and thoroughly boiled.

The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss, or “excelsior” filling. The clothing of nurses should be thoroughly fumigated and cleaned before it is taken from the house, or, better still, burned, if feasible.

10. Cases of Typhoid Fever should be promptly reported to the proper health authority by the attending physician, or by the head of the family. Immediately upon receipt of notice of the existence of a case, the health officer should visit the locality and secure prompt compliance with the precautions above set forth. He should make a careful investigation as to the probable cause of the outbreak, and if this he found to be due to an infected water- or milk supply, the use of such supply should be rigidly interdicted, and the necessary steps at once taken to correct the evil.

He should superintend the disinfection of rooms, clothing and premises; and, finally, give official certificates of recovery, and of freedom from liability to communicate the disease to others. Until these latter are issued, a system of isolation or quarantine should be maintained with regard to an infected house and its contents—persons and things.

In the event of death from a malignant case, or where there are a number of severe cases in one house or locality, the health officer should exercise even greater authority than here indicated. He should enforce disinfection, cleansing of premises, abandonment of suspected water, and other measures, arbitrarily, if necessary; and, in his discretion, should forbid public funerals where the conditions—either of the disease as to virulence, or of the sanitary surroundings—warrant such a course.

Where there is no health officer, the attending physician should see that the proper precautions are carried out, as herein advised.

11. Painless diarrhea, or simple “looseness of the bowels,” occurring, in one who has never had Typhoid Fever, should excite suspicion while this disease exists in a neighborhood. The disease varies in the intensity of its symptoms, so that mild, walking cases are not uncommon. It is advisable, therefore, that *all* diarrheal discharges should be disinfected during the existence of Typhoid Fever in a community.

### Best Disinfectants.

Sunlight, fresh air, soap and water, thorough cleanliness—for general use.

For special purposes the following are the most efficient, the simplest and the cheapest.

#### I.—Copperas Disinfectant.

Sulphate of iron (copperas).....one and one-half pounds.  
Water.....one gallon.

A convenient way to prepare this is to suspend a basket containing about sixty pounds of copperas in a barrel of water. The solution should be frequently and liberally used in cellars, privies, water-closets, gutters, sewers, cess-pools, yards, stables, etc.

#### II.—Sulphur Disinfectant.

Roll sulphur (brimstone).....two pounds.

To a room ten feet square, and in the same proportion for larger rooms. See *Rule 8*, of Section II, for mode of use.

#### III.—Zinc Disinfectant.

Sulphate of zinc (white vitriol).....one and one-half pounds.  
Common salt.....three-quarters of a pound.  
Water.....six gallons.

For application and modes of use see *Rules 5, 7 and 9* of Section II.

#### IV.—Thymol Water.

Made by adding one tablespoonful *Spirits of Thymol* to half a gallon of water. *Spirits of Thymol* is composed of—

Thymol.....one ounce.  
Alcohol, 85  $\frac{3}{4}$  ct.....three ounces.

May be used for all the disinfectant purposes of carbolic acid; it is quite as efficient in this strength, and has an agreeable odor. See *Rules 5 and 8* for application and uses. Where thymol is not available, chloride of zinc solution may be used—half an ounce of chloride of zinc to one gallon of water.

---

**THIS CIRCULAR SHOULD BE PRESERVED FOR REFERENCE.**

---

COPIES OF THIS CIRCULAR CAN BE OBTAINED BY APPLYING TO THE SECRETARY  
OF THE STATE BOARD OF HEALTH, SPRINGFIELD.







